ENGINEERING NEWS-RECORD

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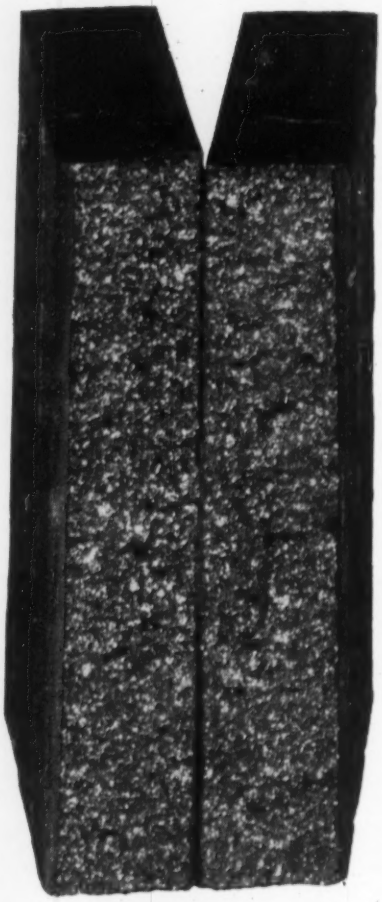
HERE IS THE DIFFERENCE

WROUGHT IRON



STEEL

These are actual photographs of fractured pieces of wrought iron and steel. The picture at the left shows the fibrous structure of wrought iron. How this differs from the crystalline structure of steel is readily apparent. It is the presence of many thousands of tiny threads of glass-like iron silicate that gives wrought iron this unique fibrous structure and it is this structural feature, duplicated in no other metal, that gives wrought iron its superior resistance to corrosion and fatigue stresses.

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WROUGHT IRON

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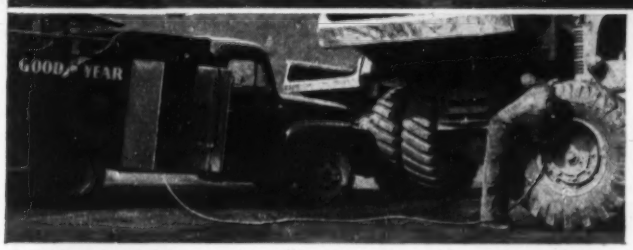
ELECTRIC FURNACE QUALITY STEEL PRODUCTS



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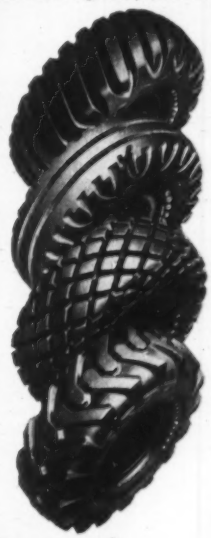

And Remember

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Robert F. Boger
Publisher

July 29, 1954 ENGINEERING NEWS-RECORD Vol. 153, No. 5

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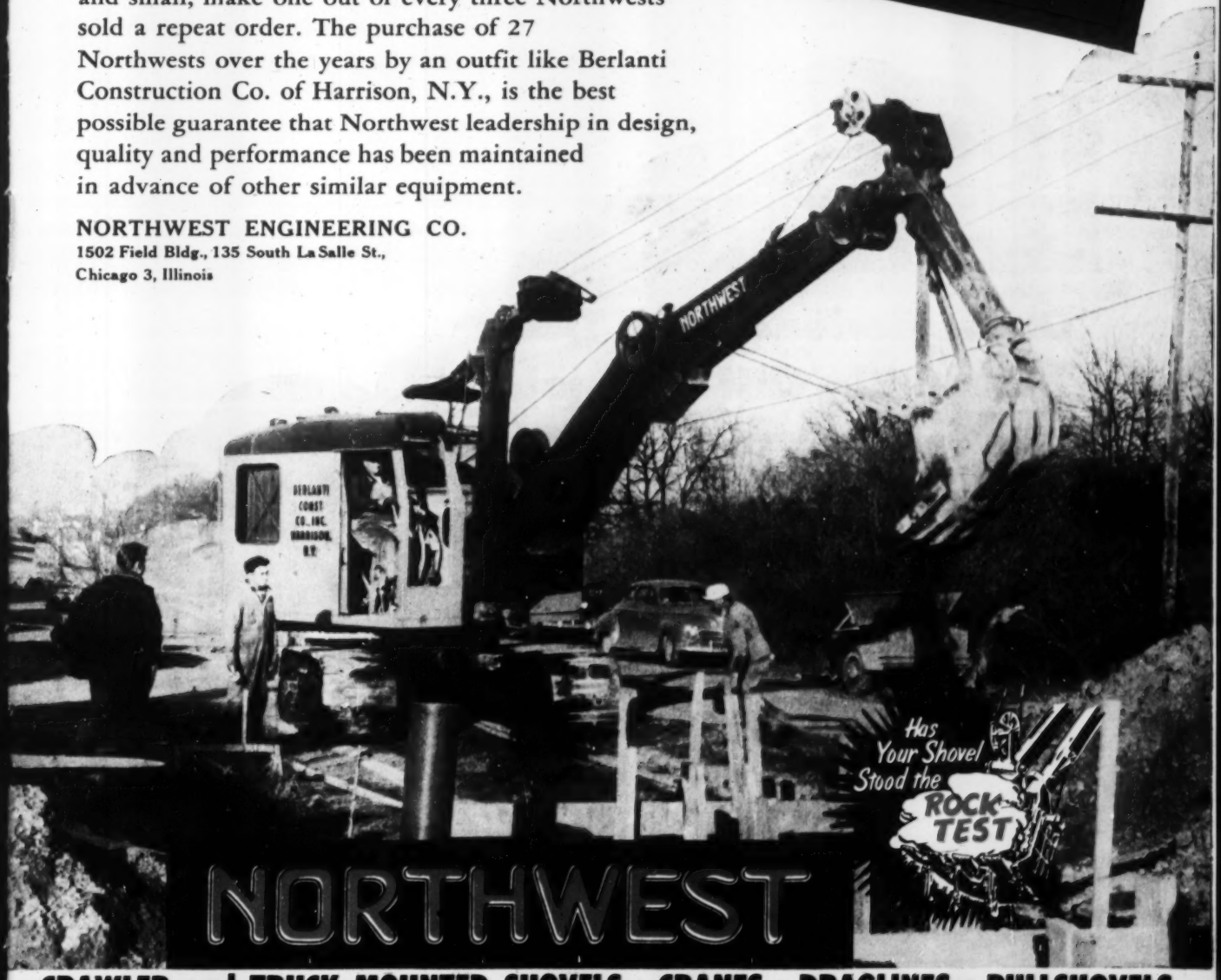

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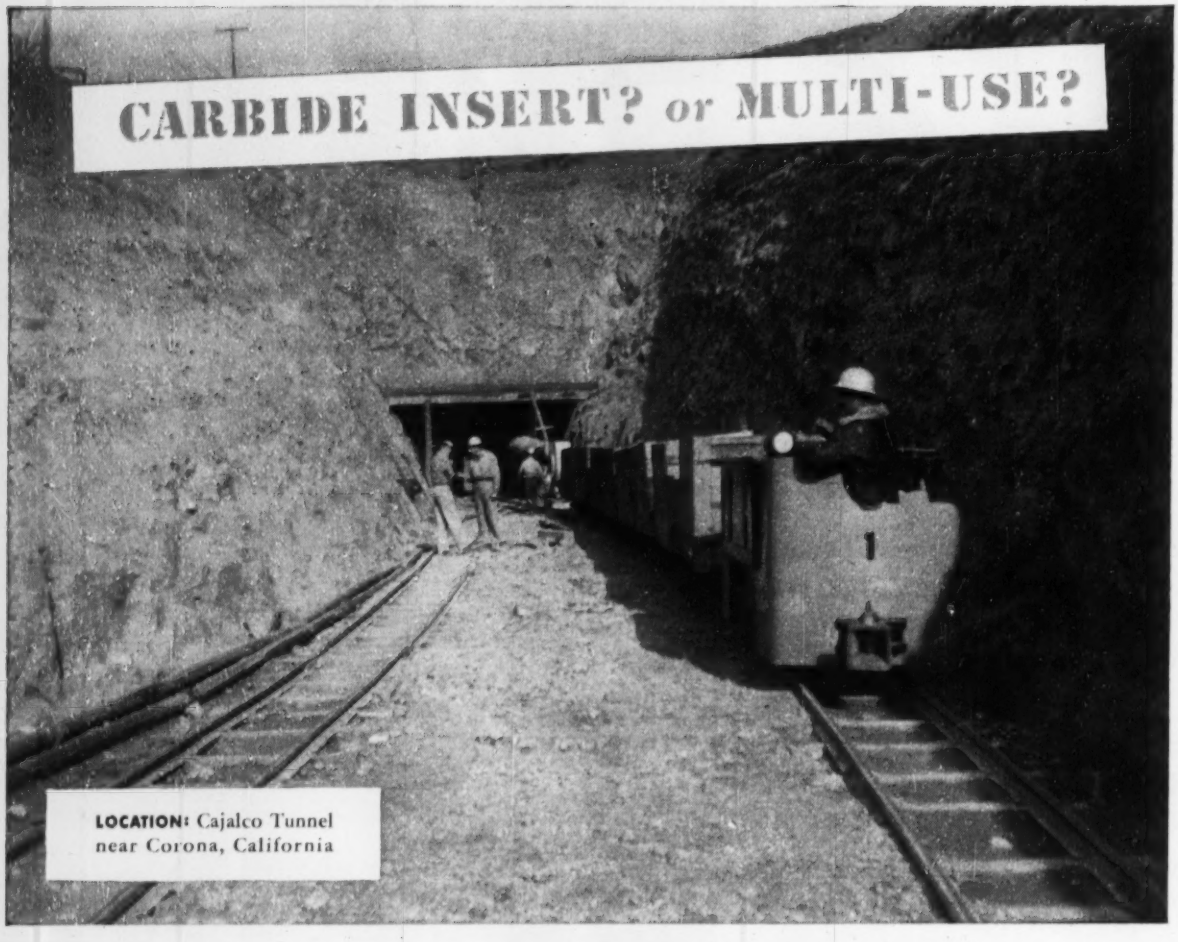

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WORKING on a diversion tunnel at the Big Cliff Dam project in Oregon, The Shea Company found that Timken® carbide insert bits did the job best. So, when it came time to start the Cajalco Tunnel, W. F. Rennebohn, General Manager, The Shea Company, again chose Timken carbide insert bits.

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Timken threaded multi-use rock bit

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TIMKEN

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For fast foolproof installation, we suggest . . .

Amvit

JOINTED VITRIFIED CLAY PIPE

says C. K. Stroh,

Partner, The Chester Engineers

Pittsburgh, Pennsylvania

Mr. Stroh went on to say:

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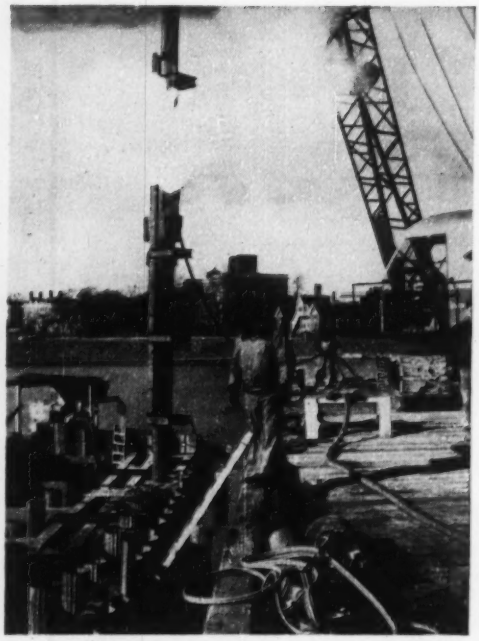

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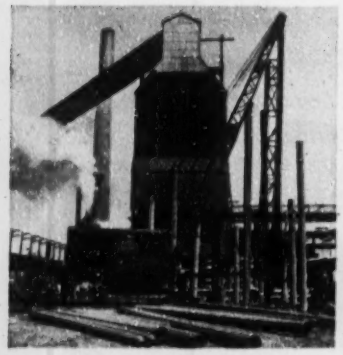

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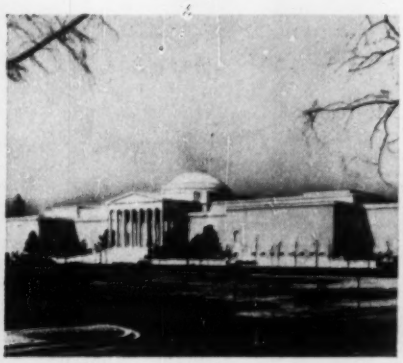
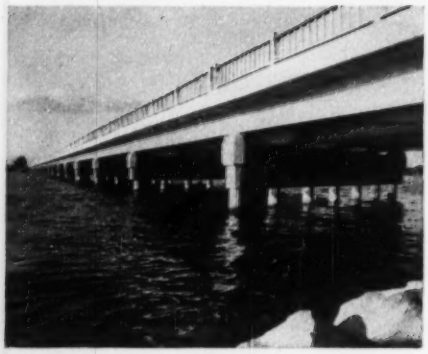


BUILDINGS



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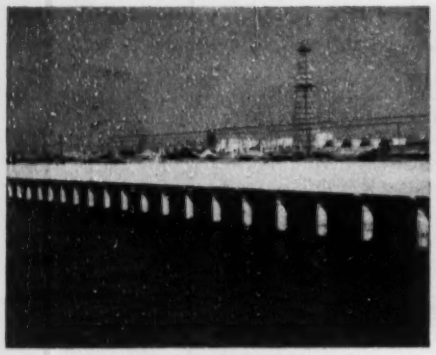

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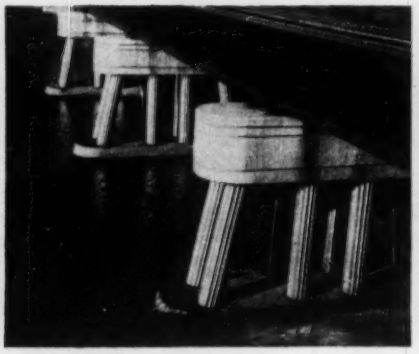

RAILROAD STRUCTURES

EXPRESSWAY OVERPASSES

UNION METAL

Monotube Foundation Piles for every foundation problem

Here's how BOWER Spher-o-honed design lengthens bearing life... cuts maintenance costs!

The Bower tapered roller bearing design features shown on this page are vitally important to every bearing user. For they illustrate the high quality, precision workmanship and close attention to engineering detail that go into *every* Bower bearing. Even more important, these Bower design features will give you significant bearing advantages such as reduced wear, longer bearing life and lower maintenance requirements. They've been thoroughly *proved* by extensive use in virtually every type of bearing application. If your product uses bearings—whatever it may be—specify Bower now. Or better yet, call in a Bower engineer while your product is still in the blueprint stage.

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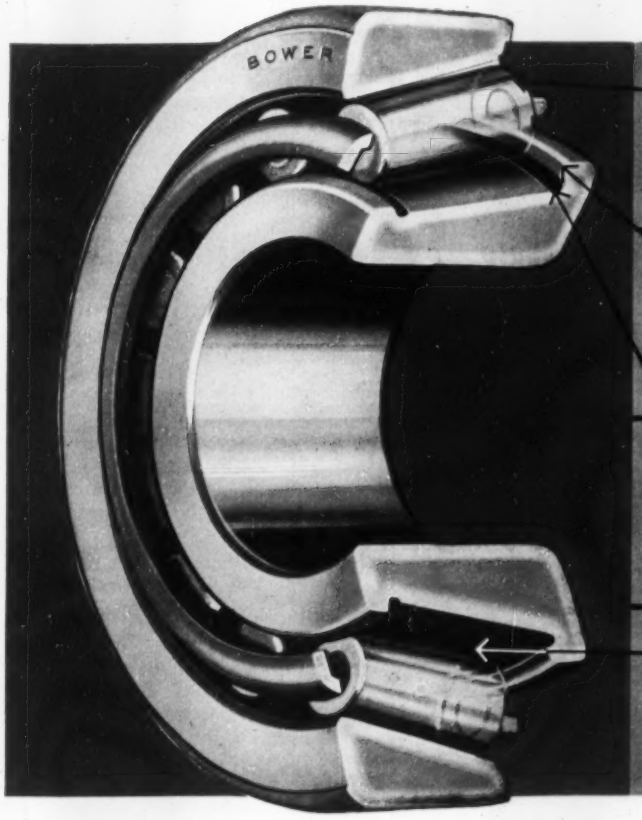

● **SPHERICAL ROLLER HEADS ARE GENERATED TO THE CONTOUR THEY ACQUIRE IN THE COURSE OF WEAR.** This helps Bower bearings hold adjustment and pre-load longer and better. Normal running-in time is virtually eliminated.

● **HIGHER FLANGE PROVIDES A LARGE, TWO-ZONE CONTACT FOR ROLLER HEADS,** thereby reducing unit pressure. This exclusive Bower feature improves roller alignment, greatly reduces wear and practically eliminates resultant "end play."

● **LARGER OIL GROOVE GIVES POSITIVE LUBRICATION** at the critical point—where the roller head thrusts itself against the cone flange. Here Bower design provides a larger recess that holds a generous supply of lubricant—increasing efficiency and decreasing wear.

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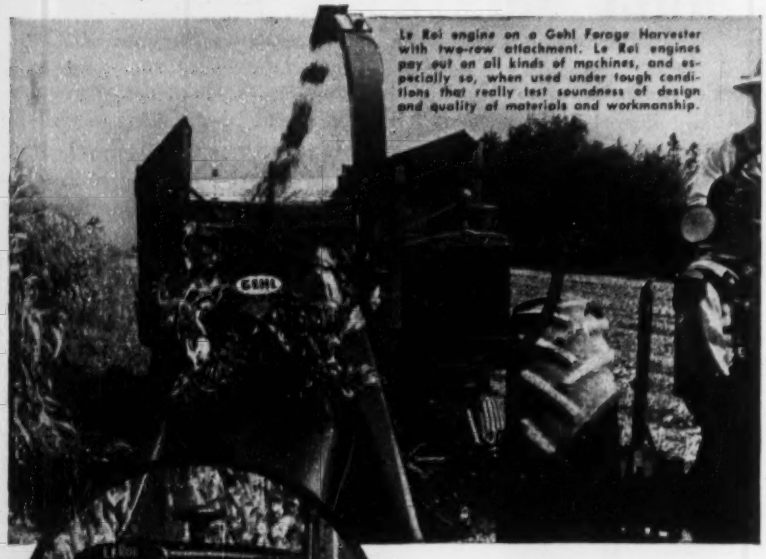
Tough jobs are easy pickin's for LE ROI heavy-duty power



Le Roi engine on a Gehl Forage Harvester with two-row attachment. Le Roi engines pay out on all kinds of machines, and especially so, when used under tough conditions that really test soundness of design and quality of materials and workmanship.

Built to stand abuse dished out to field equipment without costly breakdowns

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READER COMMENT

Settlement from vibrations

SIR: I was much interested to read the article, "Settlement from Vibrations", in your issue of May 27, p. 38. Whilst Messrs. Dames and Moore were very wise to try to obtain a direct answer to the question of whether the dynamic loading would cause settlement of the compressor foundations, I think that they have drawn unjustified conclusions from the results of their tests.

In considering the possibility of resonant vibrations of the foundation-ground system they seem to have ignored the fact that for a given load per unit area of foundation, the natural frequency increases as the foundation size decreases. (This has been shown by other investigators as well as myself). Thus, if the natural frequency of the 17 x 11 ft inertia block were 327 rpm, that of the 6½ x 3 ft experimental block might be up to three times as great. It is, therefore, unsafe to conclude that because there was no resonance in the tests at up to 545 rpm, there will be none when the compressor is operating.

If resonant vibrations are set up in the compressor foundation when it is built, the inertia of the foundation block should also be added to the out-of-balance force. For example, if an amplitude of say 0.03 in. were attained under resonance at 327 rpm, the maximum acceleration of the block would be 1/10 g. This would be equivalent to an additional out-of-balance force of 34,000 lb superposed on, but perhaps not quite in phase with, the thrust due to the reciprocating parts of the machine. Thus, under conditions of resonance, much greater out-of-balance forces may have to be allowed for than those due to the machinery.

Finally, I should be very perturbed myself if I obtained dynamic settlements, on an approximately 1:3 scale model, of ⅛ in. in only one or two hours. Firstly, if the deformations of the soil follow the pattern of the bulb of stress approximately, the settlement of the full-scale foundation would be up to ⅜ in. And tests which I have carried out myself show that settlements can still be far from asymptotic at as many as 20 million cycles, i.e. after the equivalent of about 1,000 hours.

W. EASTWOOD
Department of Civil Engineering
University of Sheffield
Sheffield, England

(*Reader Comment cont. on p. 10*)

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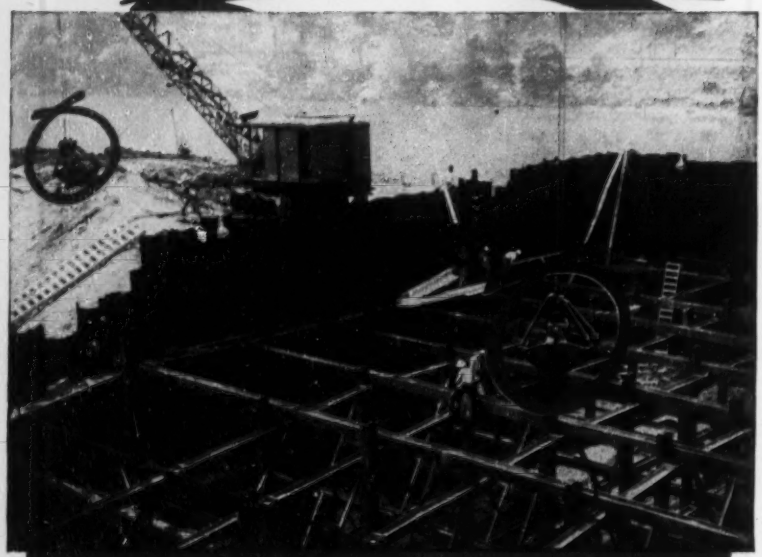

AN OWEN FEATURE

The placing of a bucket in a narrow trench or caisson; or between closely spaced cribbing requires skill.

Whether it "lands" properly to assure efficient digging is largely a matter of correct bucket design.

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READER COMMENT

Soil vibration tests

SIR: Our knowledge of energy dissipation in soils is a rudimentary one; the important test described in the article "Vibrations and Soil Settlement" (ENR May 27, p. 38) is of great interest, but for evaluation of the achieved results following data are required.

(1) What were the relative densities at different depths of the natural soil and of the "sandy fill"?

(2) What was the ground water elevation?

(3) Were horizontal or vertical vibrations used?

Experience with surface vibrators, considerably heavier than 10,000 lb (weight of shaking machine and pad), showed that they can not compact sand deeper than 5 ft. This means that the described arrangement tested the soil not deeper than 5 ft below the pad, whereas the compressor foundation will penetrate into the soil 4.25 ft below the pad and only the behavior of deeper substrata will be of any importance for the compressors.

S. STEUERMAN
New York, N. Y.

[EDITOR'S NOTE—The questions can be answered as follows:
(1) The old dune sand—naturally deposited sand and not fill—has uniform density and graduation for at least 50-ft depth. Thus, a test near the surface was believed indicative of possible future action for deeper foundations.
(2) Ground water is about 100 ft below surface level.
(3) As the compressors to be installed would impose horizontal vibrations only, the shaking machine was set to induce similar movement.]

CALENDAR

Conference on new developments in engineering design, Virginia Polytechnic Institute, Blacksburg, Va., Aug. 4-6.

National Council of State Boards of Engineering Examiners, annual meeting, Hotel Saint Paul, St. Paul, Minn., Aug. 26-28.

American Society of Civil Engineers, hydraulics division, annual convention, Austin, Texas, Driskill Hotel, Sept. 8-10.

National Highway Conference of County Engineers and Officials, ARBA, Deshler-Hilton Hotel, Columbus, Ohio, Sept. 13-15.

Illuminating Engineering Society, national technical conference, Chalfonte-Haddon Hall Hotel, Atlantic City, Sept. 13-17.

Society for Experimental Stress Analysis and International Congress and Exposition: Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 21-23.

Southeastern Association of State Highway Officials, annual meeting, Andrew Jackson Hotel, Nashville, Tenn., Sept. 28-30.

New England Water Works Assn., Poland Spring, Me., Oct. 4-6.

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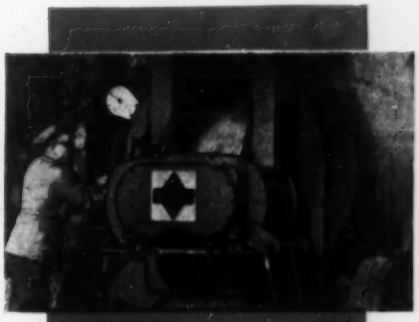

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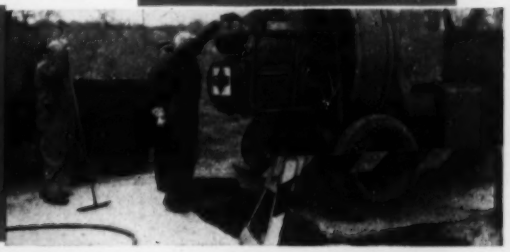

"Stitch-in-time" maintenance prevents major breakups; the Mixall works in any weather.

Resurfacing busy crossings, Mixall's compactness allows minimum traffic interference.

Barber-Greene

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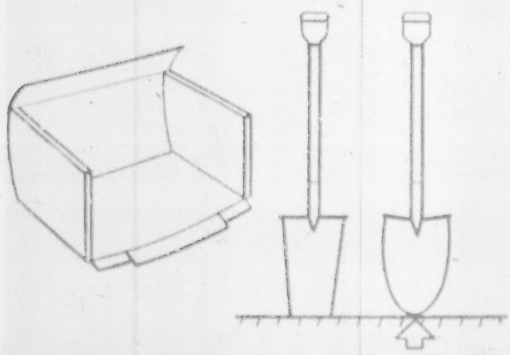
MR. CONTRACTOR: Compare these dirt-

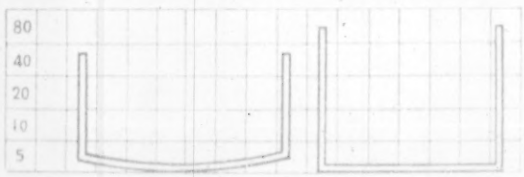
PENETRATES FASTER

Curved and offset cutting edge on Allis-Chalmers Motor Scrapers concentrates all the horsepower on the center section during initial penetration. The penetrating ability of a round-end spade helps illustrate the practical soundness of this Allis-Chalmers design.



LOADS FASTER

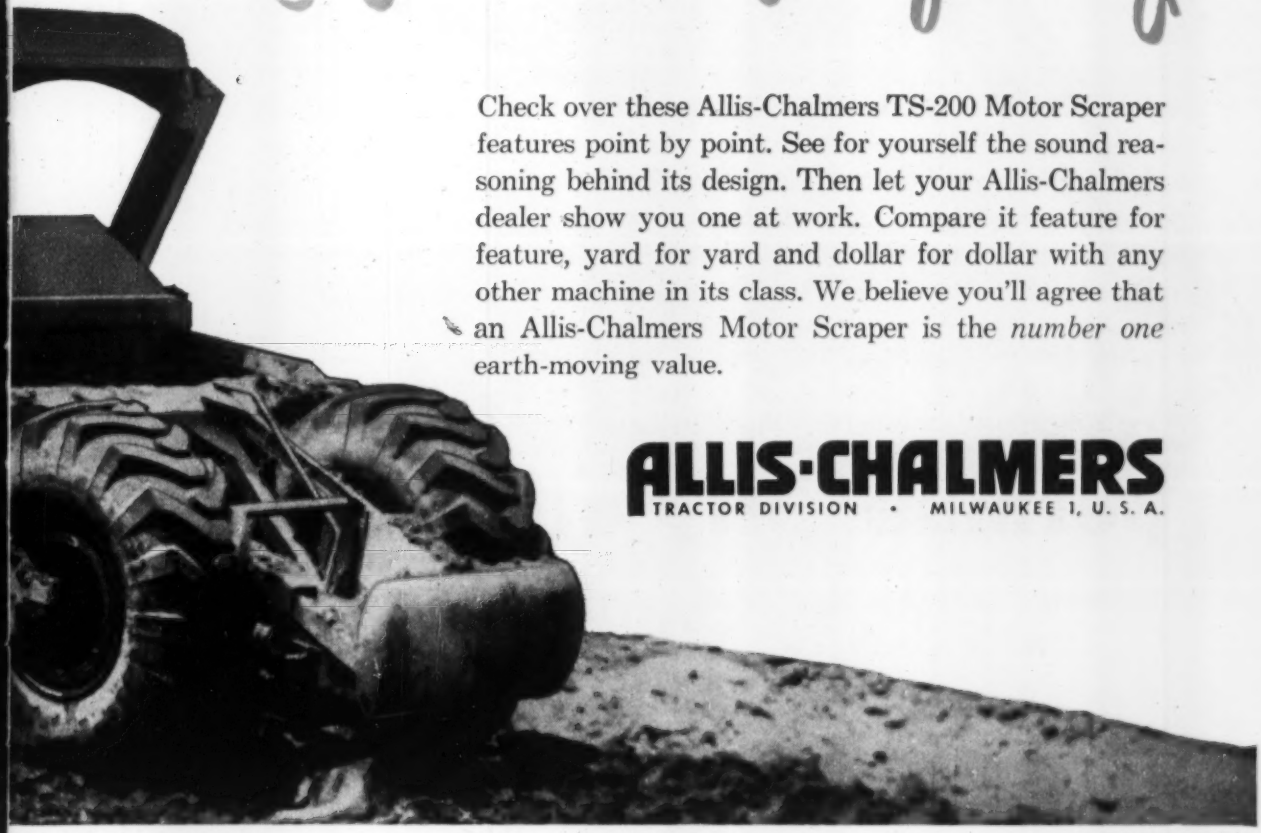
Low, wide bowl plays an extremely important part in ease of loading. Tests have proved that loading resistance is largely determined by the height to which the load is built. New dirt entering the bowl must lift the load directly above it in order to make room for itself.



This chart shows how loading resistance continually increases as the load builds up . . . how the lower, wider bowl of an Allis-Chalmers Motor Scraper requires less time and power to get the same yardage.

PERFORMANCE MAKES DOLLARS

moving features before you buy

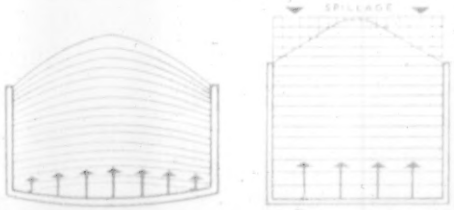


Check over these Allis-Chalmers TS-200 Motor Scraper features point by point. See for yourself the sound reasoning behind its design. Then let your Allis-Chalmers dealer show you one at work. Compare it feature for feature, yard for yard and dollar for dollar with any other machine in its class. We believe you'll agree that an Allis-Chalmers Motor Scraper is the *number one* earth-moving value.

ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

HEAPS AUTOMATICALLY

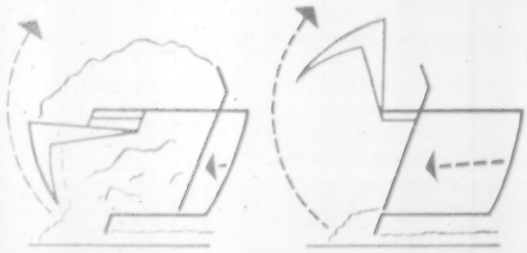
The combination of slightly deeper center cut and correctly angled cutting edge shapes the load as the scraper fills. The greater volume of dirt flowing into the center of the bowl "boils" forward, to the rear and to the sides, producing an automatically heaped load without excessive spillage.



These diagrams show how an automatically heaped load avoids costly spillage even though the center is built up above the sides of the bowl.

SPREADS EVENLY

Forward movement of ejector is timed with lifting action of apron, which provides a continuous flow of material to insure a smooth, even spread.



High apron lift prevents any possibility of material's jamming. Even when loaded from overhead, anything that can be put into the bowl can be easily ejected.

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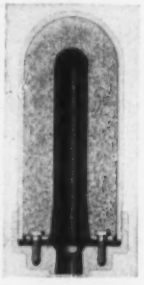
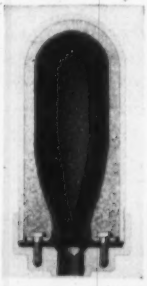


Cutaway view showing Absorbo tube and insert in normal position.



Showing how Absorbo tube and insert expand to absorb shock.

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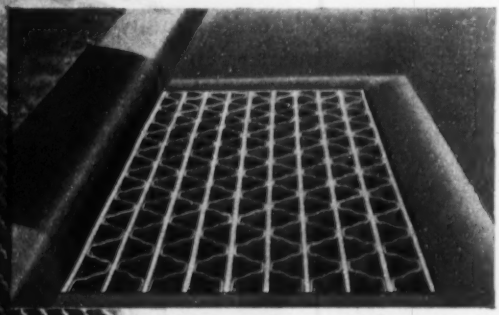

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ENGINEERING NEWS-RECORD

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THE CONSTRUCTION WEEK

PLENTY BIDDERS?—There's no assurance that it means anything but New York State's Power Authority is happily contemplating the fact that 140 copies, at $50 each, of plans and specs for its Aug. 6 letting have been taken out.

The contract (ENR July 15, P. 84) covers first work on the St. Lawrence power development.

CONSULTING WORK—Hoping to kill off unionization attempts among engineering personnel, the Indiana Toll Roads Commission will have its engineering work done by professional engineering firms, rather than by contractor forces.

Commissioners had their eyes on Ohio's troubles, where unions attempted to organize sub-professionals after contractors were permitted to handle some design work (ENR July 22, P. 24).

HOW MUCH SALARY?—There's a considerable difference beteewn the salary report released by the Canadian Department of National Revenue, and the one put out by Council of the Canadian Federation of Engineers and Scientiests.

According to the government agency, engineer and architect salaries range between $10,000 and $12,000 a year. According to the council, the salary average is $6,950 a year.

SPREADING THIN—And, speaking of salaries, Indiana hoped to attract personnel, with raises in pay for its highway engineering force.

The state budget committee approved the idea and an appropriation of $29,000 to be used for the added wages. The money is to be divided among some 400 engineering positions.

WINDOWS OUT—Ohio's Board of Building Standards has liberalized the state building code to permit construction of parts of hospitals without windows.

The board acted in connection with a $1.5-million addition to the Middletown Hospital where designers wanted operating rooms and X-ray rooms windowless for sanitary and lighting purposes.

The state code specifies natural ventilation and natural light.

PAY FOR USE?—Virginia's State Highway Commission made no bones about who it thinks should pay for roads.

Said the commission in an official statement: Private industries should make substantial contributions toward construction of roads which would be used principally by the industries and their employes.

Steel for Denver's Mile High Center Erected in 82 Days

A remarkable new building is rapidly nearing completion in Denver, right across the street from the famous old Brown Palace Hotel. It is 1700 Broadway, a striking 23-story office building, principal structure of the spectacular "Mile High Center."

Fully air-conditioned, equipped with electronically-controlled elevators, and featuring an open ground floor and dramatic new facade treatment, the tall, graceful tower strikes a new note in beauty and efficiency. The Mile High Center will also include a handsome bank and office building, and a two-story structure housing a clear-span airline terminal on the street level, with a restaurant and shops below.

HIGH-STRENGTH BOLTS SPEED ERECTION

One of the eye-opening aspects of 1700 Broadway is the speed with which Bethlehem erected the 4600-ton steel framework. By using high-strength bolts instead of field-driven rivets, Bethlehem's erection crew was able to complete bolting the same day they finished steel erection—trimming a full week off erection time. Averaging better than 55 tons of steel per day, Bethlehem completed the entire job in just 82 working days.

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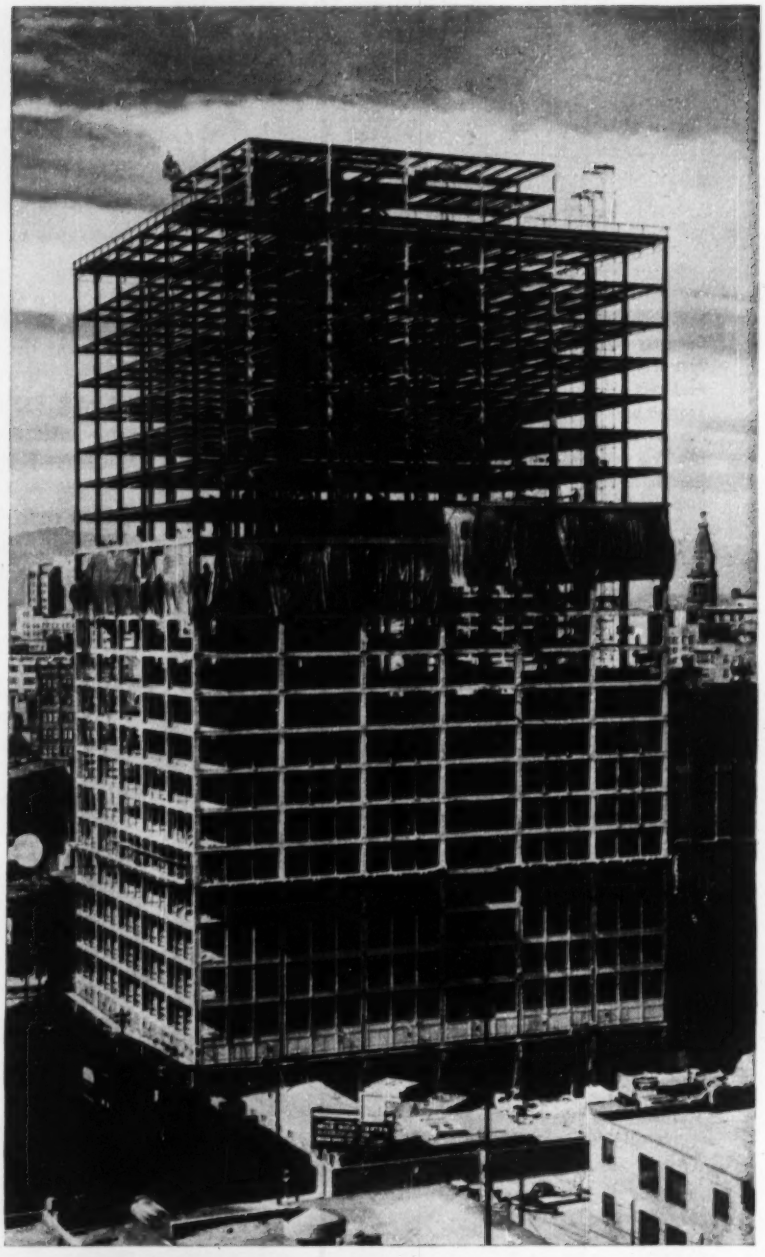
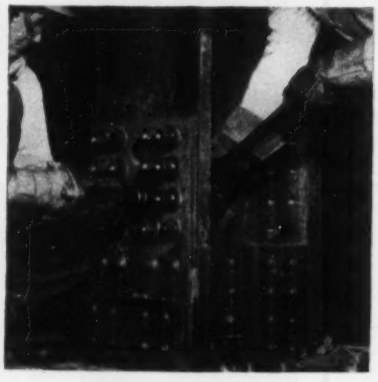


Completed structural steel framework of 1700 Broadway. Pouring of concrete and installing of aluminum cover panels was well under way when this picture was taken. *Owner:* Webb & Knapp, Inc., and George A. Fuller Co. *Architect:* Webb & Knapp, Inc., Architectural Div., I. M. Pei, director. *Associated Architects:* Kahn & Jacobs and G. Meredith Musick. *Consulting Engineers:* Jaros, Baum & Bolles and Severud-Elstad-Krueger. *Contractor:* George A. Fuller Co. *Steelwork:* Bethlehem Steel Co.



High-strength bolting, pioneered by Bethlehem, requires a minimum of men and equipment, speeds and simplifies erection.

WASHINGTON OBSERVER

Air Secretary Talbott is source of reports of big changes in Spanish bases. After his return from tour of Europe news stories hinted of new bases being added, sites of planned bases being changed. Actually, the Pentagon has no existing plans to build more than the four Air Force and one navy base now included in "Phase One" of the program (see page 24).

Speculation about expanding the program is helped along by the fact that the military would like—sometime—to build interceptor bases ringing the major bases now in the works. And they also would like to have more major bases. But they're a long time in the future.

•

Construction business was at the heart of the big Senate fight over atomic energy legislation.

Approval of construction of the $107-million power plant by the Dixon-Yates utility combine at the West Memphis, Ark., site was the biggest single item pinned down by the Senate. The House has approved the deal. And Eisenhower is expected to win out when the bill goes to conference. There's still talk by the pro-TVA bloc of taking their fight to court, on the ground that the President's order to the Atomic Energy Commission exceeded his authority. But congressional debate and decision on the issue makes it unlikely they can delay the project.

•

Public power plants using atomic energy were successfully pushed in the Senate by an anti-Administration block. They put through an amendment that would authorize AEC to build up its four or five experimental reactors into full-size power plants to be "yardstick" plants for atomic power in the same way that public power from TVA was pushed.

Public power politicians see a fairly easy way of expanding AEC establishments to get civilian electricity, and that way, they say, pay back to the government money to help defray cost of atomic experimentation. Arco, Idaho, Downey, Calif., in the West, and Oak Ridge in the TVA could be expanded by construction of additional reactor capacity. The same goes for the Brookhaven plant on Long Island, N. Y.

This public power amendment won't stick in the final bill—but it does hint of more amendments to the AEC Act next year, especially if the Democrats should get control of Congress again.

•

Neal J. Hardy, Assistant Housing Administrator, will head up the National Association of Home Builders new housing center in Washington, D. C. The eight-story, air-conditioned building will house the NAHB and allied industries in construction. Hardy has been with HHFA since 1947.

•

A new look at present practices in design and construction of airports is being taken by a group under the direction of Adm. J. F. Jelley, construction chief for the Assistant Secretary of Defense for Installations, and Fred S. Poorman, chief of the technical division in Jelley's office.

Idea is that progress in plane performance and military strategy may have outstripped airport design. Airline and Air Force officials will be helped by Parsons, Brinckerhoff, Hall and Macdonald, New York City engineering firm.

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The core of a Gold Bond "Firefighter" Roof Deck is incombustible gypsum concrete. 25,000 feet of natural fire resistance is molded over the bowstring structure of this Augusta State Armory. The 5-inch-to-the-foot rise of this installation indicates the versatility of poured-in-place gypsum roof decks.

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..."FIREFIGHTER" GYPSUM ROOF DECK

A GOOD SOLUTION—"Dumbbell" layout, in the Cross County Shopping Center, Yonkers, puts two main stores at either end.

Shopping centers: The boom raises problems

J. R. Owen
Assistant Editor

Shopping center construction, unimportant to most builders only a few years ago, has grown to giant size. Today it is a major source of income—and headaches—for the construction industry.

Shopping centers account for much of the current boom in commercial building, now running 12% above last year's all-time high. In May, for example, ENR reports showed that 21 shopping center projects representing $37 million of construction were included in the month's $129 million of commercial construction contracts.

In other recent months, shopping center construction has held close to this level, generally amounting to nearly 25% of all commercial building.

As many as four proposed shopping centers have been entering the backlog each month, according to ENR reports. Cost of these projects ranges up to $40 million. And, like most other commercial construction, they are off the backlog list in short order. Total backlog increase for all commercial construction for the year ending in June was only $62 million.

• **But headaches, too**—Unfortunately, too much of the shopping center construction has been of the "boom town" variety. Inadequate planning seems likely to condemn a considerable number of the more than 1,000 shopping centers built in recent years to a bleak future. Standing out like sore thumbs are many examples of inexpert location, poor site planning and flagrant violations of good building practice and accepted merchandising patterns.

Victor Gruen, architect with experience in designing 15 centers says:

". . . The few good suburban shopping centers that have been built—and there are not more than 10—form the only oases in the vast desert of unhappy shopping experiences, because shopping has become a task rather than a pleasure. . . .

". . . Suburban shopping facilities are to the largest extent makeshift, planlessly, quickly directed, honky-tonk strips of stores along busy highways, offering little to the shopper in the line of shopping convenience, completeness and safety."

In those words, Gruen sums up a situation that threatens to continue unless promoters and developers learn from past mistakes.

• **The strip center**—There is hardly a design "don't" that can be mentioned that has not been evident in the strip-type shopping center. And, this type has become most prevalent.

What are some of the features common to practically all strip centers that should be avoided:

• Location on a principal highway with store-fronts hugging the curbs.

• Inadequate parking facilities in the rear with access through blind alleys.

• Long buildings, with the "magnet unit" (department store) centered or at one end.

• Entrance to stores on the front (street side) only.

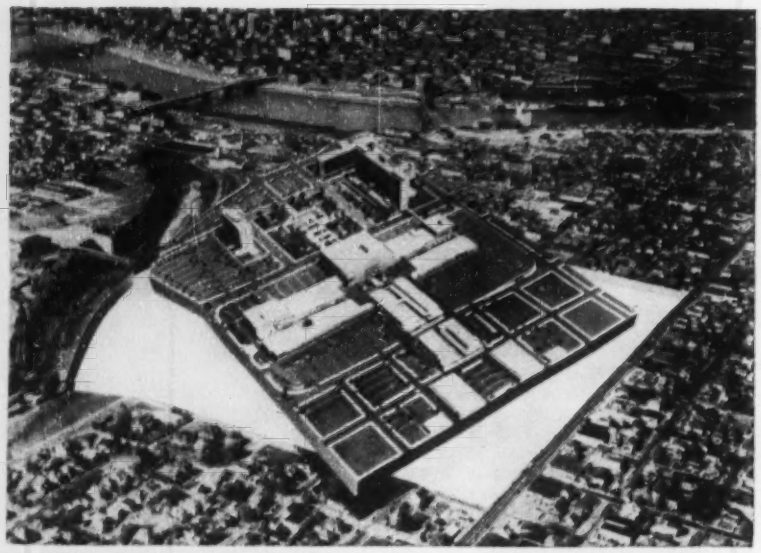
• Honky-tonk appearance.

As one developer has said, "these 'miracle strips' seemed to have been planned with malice aforethought, and the only miracle seems to be that some of them have made money."

Location of a strip-type center along a main highway raises a number of serious problems, particularly in traffic handling and parking.

It is imperative that through traffic be interfered with as little as possible. If access is impractical from lateral streets on either side of the center, deceleration lanes are needed to ease the swing out of main-stream traffic. In more than one case, the interference with traffic flow past a strip-type center has been so serious that expensive by-pass routes had to be built.

Location of buildings toward the rear of the site will provide parking facilities in front of the stores, thus removing necessity for the long hike from the back of the center, around the long buildings to the front entrances of shops. This treatment of building location has the added advantage of separating service and delivery traffic from shopper traffic, with



CLUSTER—Lloyd Center, only six minutes drive from the business district of Portland, Ore., centrally locates main unit on housing-shopping tract.

down-the-alley grouping or around-the-end sprints being limited to trucks with business at the leading platforms in the rear.

When because of topography or foundation problems it is necessary to place the building at the front of the area, the most important features to strive for are attractive rear elevations for shop buildings, with display cases and inviting access at the rear of the building as well as the front.

Perhaps the most unfavorable note sounded by leading designers in discussing strip-type centers is that the prime unit (department store or super market) usually does quite well—at the expense of the other shops.

The main store occupies the most ideally located portion of the center, with shops spread in a straight line in two directions from it. Studies show that the success of a shop appended to the main store varies with its proximity to it. The nearer the shop, the better the business.

• **Let's look to planning**—One of the first factors that becomes apparent, after planning several shopping centers is the difficulty of setting up any sort of formulas for getting the most out of a site. There is, perhaps, no other planning field that is confronted with such a host of variables affecting choice of site, type of layout, structural and foundation techniques and merchandise planning.

R. H. Macy & Co., nationally known for its department stores and currently engaged in development or construction of six major centers, finds that each is a separate and unique problem, according to John I. Harvey, assistant to the vice-president in charge of planning and development.

Harvey says that instead of formulas, his company starts the ball rolling with two simple rules:

• Never decide upon a site until a traffic study has been made by a recognized traffic engineering consultant. And conduct your own studies, too, so that each can check the other.

• After deciding on a location put the subsequent planning and design the hands of capable design engineers.

Even in the preliminary planning phase there is plenty of room for disagreement between authorities. In studying prospective market sources, Macy has its own set of rules.

The company considers its positive consumer area as far more limited than most planners. Macy figures only 15% of total business will come from beyond this small area.

In order for a proposed site to be acceptable, 85% of its prospective consumer market must lie in an area that is not separated from the stores by railroad crossings at grade, rivers or hills.

Time-distance studies are conducted on the basis of a positive market within four miles—10 to 15 minutes—travel from the center. For food or drug business the bulk of the market will lie within one and one-half miles.

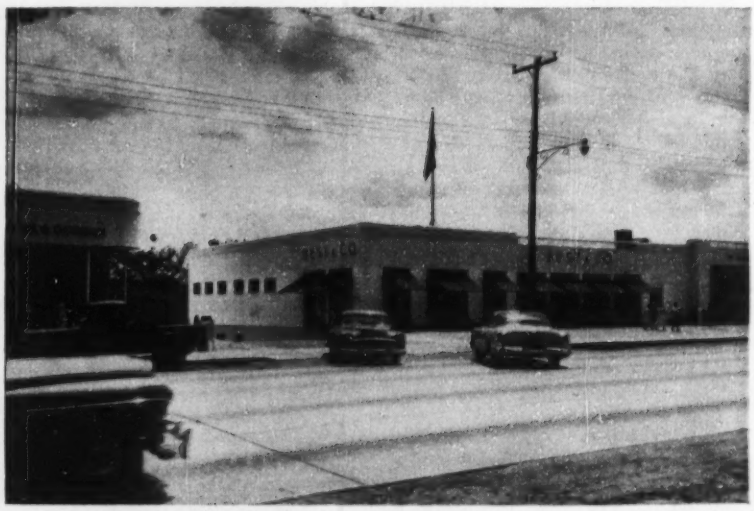
One of the foremost considerations in site selection, according to Kelly & Gruzen, architect-engineers, who have designed several centers, is the availability of utilities. Expense of bringing these to a site may render its purchase prohibitively costly.

K&G, consultants for the Grand Union chain of food stores, cite another example of the importance of planning:

The Grand Union Company had considered an ambitious shopping project on the site of the old Grand Union Hotel in Saratoga, N. Y. Had the company gone ahead without benefit of a careful study, the center quickly would have joined the ranks of shopping center fiascos for the study revealed that there was not sufficient market for the center as planned.

As a result, plans were modified and while the project is still extensive, it is reasonably assured of being one of the company's successful endeavors.

• **How about design?**—Planned centers are reaching a point where representative types are numerous enough to be classified. Each has its own governing features, but the most common factor in the "new look" is a central location for all buildings, with parking facilities



STRIPS STILL HUG HIGHWAYS resulting in hikes from rear parking lots and inadequate two-way driveways leading blindly into arterial traffic.

and landscaping surrounding them.

Averages distances from car to center are successfully being held to about 150 ft. Other common features are underground truck routes for deliveries, covered arcades and malls connecting buildings, structural units of more than a story in height and the use of escalators, and material conveyors for easy customer and purchase handling.

• **The cluster center**—Where there is but one main unit in a proposed center, the most common pattern in planned projects is the cluster. With variations, of course, the magnetic main unit is placed near the geographic center of the tract, and attendant shops are clustered around it.

Parking is in one or more levels surrounding the centered group of buildings. One of the most successful examples of the cluster-type center is the Northland Shopping Center, a Gruen project on the outskirts of Detroit (ENR Dec. 17, 1953, p. 43).

• **The dumbbell center**—An example of the dumbbell pattern in centers is the Cross County Shopping Center in Yonkers, N. Y., which has as its main units both the John Wanamaker and the Gimble Bros. department stores.

In this arrangement, the two magnetic units are placed at end points of the building pattern, with shops on malls connecting them. This gives the smaller shops a chance to attract customers passing between the main units.

As in the cluster pattern, the building group is close to the center of the tract with surrounding parking facilities conveniently near.

If there are office buildings, public buildings or hospitals planned within the tract, these need not be placed in the shopping center group.

• **Built in stages**—In the Garden State Plaza, Paramus, N. J., one of the R. H. Macy projects currently under construction, the initial stage of construction will be a cluster pattern, but the building group will be located off-center on the tract to allow expansion through a second stage that ultimately will transform the center to a dumbbell type.

In this project, several unusual conditions point out the necessity for specific planning for each center. Site conditions were poor—the tract was timbered, low, largely swamp and had a brook running through it.

However, Macy's planners found through studies that the location potential outweighed the added expense of site development. To date 900,000 cu yd of fill have been placed at Garden State.

Eisenhower will get tax revision bill designed to keep construction rolling

An Administration-sponsored tax revision bill designed in main part to keep construction rolling in high gear is just about ready for the President's signature. House and Senate conferees have agreed to most of the provisions aimed at simulating a new round of investment in plant and equipment. There are still some points in conflict.

One provision of special interest to the construction industry was dropped in the final round of conferences. This was a Senate amendment giving the advantages of fast depreciation to any project completed after Dec. 31, 1953.

The bill as it will be signed by the President, limits fast depreciation to that part of the costs which were incurred this year. The decision deprives owners of projects under construction Dec. 31 of tax deductions for costs incurred last year and opens up the possibility of some tough wrangling later with the tax collectors. Builders will probably get involved in a good many of these disputes.

Fast depreciation is not the only provision designed to stimulate investment (see page 91). There is special relief for dividend income; loss-carry backs can now be taken for two years instead of one as in the old law; and the rules inflicting penalties on undistributed surpluses have been liberalized. The Administration believes each of these will make new investment funds available.

In addition to giving investment a push, the bill revises the entire revenue code with the purpose of clarifying its language and simplifying the rules.

It also extends the corporation income tax rate another year at 52%, instead of allowing it to drop to 47% as in the old law. This provision will provide $1.2 billion revenue which otherwise would have been lost—almost paying the entire $1.4-billion cost of the revision provisions.

Architect-engineers selected for new Air Force Academy

Air Secretary Talbott has named the architect-engineers for the $126-million Air Force Academy in Colorado, and in his announcement he said this would help to get construction started by early 1955.

Skidmore, Owings and Merrill of Chicago will be the architects. Associated with them are three engineering firms: Syska and Hennessy of New York; Moran, Proctor, Mueser and Rutledge of New York; and Robert and Co. of Atlanta.

Congress acts on construction bills

Construction legislation moved forward on several fronts last week as Congress put on a spurt in an effort to attain its adjournment goal of Aug. 1:

• **Foster Creek**—The House adopted the conference report and cleared for the President's signature an authorization of $4,798,000 for construction of the irrigation works comprising the Foster Creek division of the Chief Joseph Dam project in Washington State.

• **Supplemental appropriations** — In floor action the House restored construction money eliminated by its Appropriations Committee. This included a restoration of the full $22 million requested for matching state funds under the Federal Aid to Airports Act and $15.9 million of the $35 million requested to start the program for diagnostic centers and nursing homes for the chronically ill. The Senate won't act on this bill until the closing days of Congress.

• **Tri-dam**—The House Interior Committee reported an authorization that would provide for contingent federal assistance for the $47-million Tri-dam project on Stanislaus River in California. The measure authorizes the federal government to lend the utility district up to $10.3 million interest free to supplement what it will be able to raise through issuing bonds.

• **Upper Colorado**—The Senate Interior Committee reported a bill that would increase the authorization from the approximate $1 billion approved by the House Interior Committee to $1.5 billion. The committee added three new storage units and three participating projects. The new storage units: Cross Mountain, $50 million, in Colorado on the Yampa River above proposed Echo Cayon; Flaming Gorge, $83 million, upstream from Echo Park on the Green River; and Navajo, $68 million, on San Juan River in New Mexico. Participating projects added: Gooseberry in Utah, $6 million; Navajo, in New Mexico, $174 million; and San Juan Champa in New Mexico, $144 million. Last two are contingent on a final report by the Interior Department and further legislation by Congress.

Spanish base projects near bid stage

Runway and aprons for two sites to be let in August—poor drainage may force relocation of one other airfield

First construction contracts on the $116-million Spanish base program—which includes five airbases—are expected to be advertised next month for bidding by Spanish contractors. These initial contracts will cover runway extensions, taxiways and two aprons at the $14-million base near Zaragoza and at the $43-million Torrejon base near Madrid.

Master plans have not yet been completed for the $14-million base at Moron, southwest of Seville, or for the $15-million naval air facility at Cadiz, so that start of work at these sites is not yet scheduled.

The base planned for El Copero, five miles south of Seville, has run into more serious difficulties in the form of a drainage problem that may require removal of this base to another site. Air Force Secretary Harold Talbott revealed last week that an engineering study is under way to determine whether or not the El Copero site can be used.

In the meantime, during the 10 months since the U. S. architect-engineer firms for the Spanish bases were selected and the eight months since the U. S. management contractors were named, these two groups have been busy, in offices established in Madrid, with a multitude of organizational and planning problems. Contracts have been made with a number of Spanish engineers and architects to assist in drawing up the master plans for the bases. This work is going forward in the U. S. architect-engineer office. Then, as fast as master plans have been approved by the Air Force, other Spanish architect and engineer firms have been given contracts to draw up the detail plans in their own offices. It is these plans, after their approval by the U. S. architect-engineers, upon which the construction contracts will be let.

While this work has been going on, the U. S. management contractors have been familiarizing themselves with the abilities of Spanish contractor firms interested in bidding on the work. They also have assembled some U. S. government-owned construction equipment at the airbase sites, which will be rented or leased to the successful Spanish contractor bidder.

Site investigations by both groups have gone ahead in the field.

The Spanish base program, both Air Force and Navy, is under the overall direction of the Secretary of the Air Force, with the work in Spain being headed up by Air Force Maj. Gen. August W. Kissner as Chief of the Joint Military Assistance Group. Actual construction responsibility, however, has been assigned to the Navy's Bureau of Yards and Docks, with Capt. Robert H. Meade as officer in charge.

The U. S. architect-engineer firms on the Spanish bases are Frederic R. Harris, Inc., of New York; Metcalf & Eddy of Boston; Shaw, Metz & Dolio of Chicago; and Periera & Luckman of Los Angeles. Edward J. Quirin, president, Frederic R. Harris, Inc., is chairman of the policy committee of the architect-engineer firms and John T. Stafko, also of Harris, is their project manager in Spain.

The management-contractor combine is made up of Raymond Concrete Pile Company of New York; Walsh Construction Company, Davenport, Iowa; and Brown and Root, Houston, Texas. J. J. Collins of Raymond, heads up the contractor group.

Toll road repair

Pennsylvania Turnpike's original section to get 22 miles of resurfacing

A contract for resurfacing 22 miles of the original Pennsylvania Turnpike with bituminous concrete was let July 13 to the Latrobe Construction Co., of Latrobe, Pa., on a bid of $1,045,106. The contract calls for completion of all resurfacing by Oct. 15.

The pavement to be resurfaced is in the mountainous section of the turnpike near Somerset, Pa., between Laurel Hill Tunnel and Allegheny Tunnel. It was laid in 1940 (ENR July 4, 1940, p. 53) and is of concrete, 9-in. uniform thickness reinforced with mesh set 2 in. below the surface. The lanes are 24 ft wide.

This part of the turnpike system was designed for traffic loads of that period. It did not include a prepared subgrade foundation, or improved draining methods as used today.

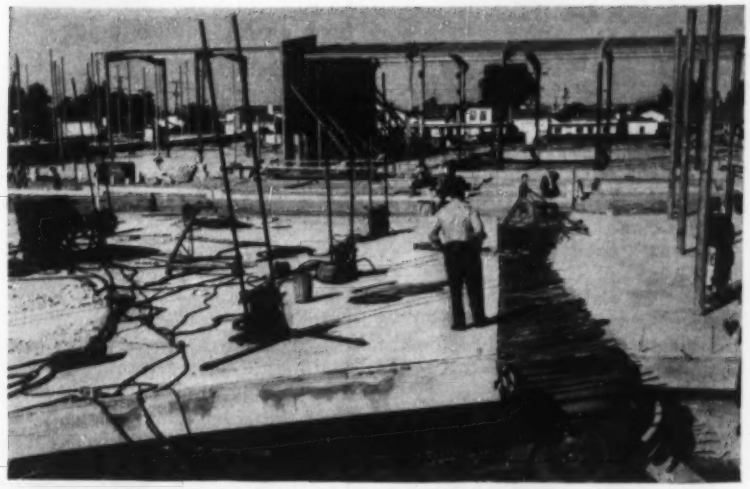
Despite the exceptionally heavy traffic over the years, plus the tremendous unanticipated overloading of the war years, which came almost coincidentally with the opening of the original section of the Pennsylvania turnpike, the pavement held up exceedingly well without deterioration, in the opinion of the turnpike authority. Only recently has resurfacing become advisable on this portion of the original 160-mi section.

Specifications for the new work call for a leveling course of bituminous concrete where necessary. This is to be followed by a 2-in. binder course of asphaltic concrete topped with a 1-in. wearing surface.

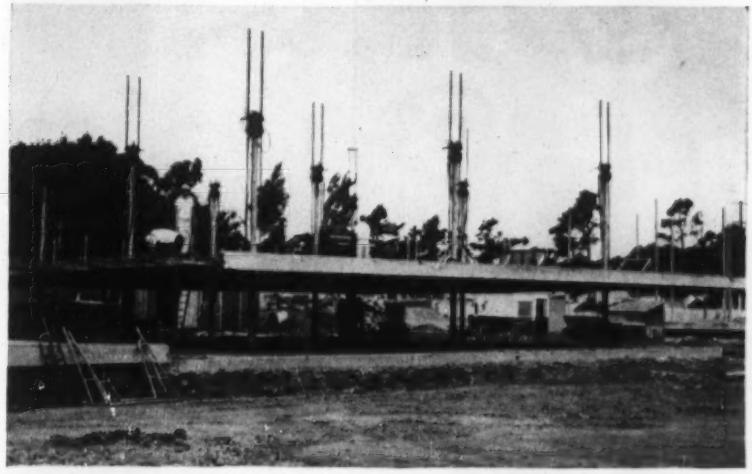
Welded wire mesh is to be laid on the leveling course or the original concrete before the binder course is put down. It is to be of No. 10 gage wire spaced 3 in. x 6 in., in sheets 11½ ft wide and 7 or 8 ft long.

Pavement on the newer sections of the Pennsylvania Turnpike is 10-in. reinforced concrete laid on 6 in. of prepared foundation material.

For the resurfacing operation, one 24-ft pavement will be freed of traffic at a time, traffic being diverted to one of the opposing traffic lanes.



This lift slab collapsed when . . .



. . . These pipe columns failed

Eight workmen and spectators were injured July 15 in San Mateo, Calif., when a 250-ton lift slab roof for a shop building for the new Serra High School, owned by the Archdiocese of San Francisco, fell just as it neared its full 16 ft height.

The injured were standing on top of the 8½-in. thick, 65x70-ft concrete slab when the accident occurred. Because this was the first lift-slab job in the San Francisco Bay area, invitations had been extended to architects and engineers to witness the lift, which accounts for the spectators.

The slab was supported by nine standard 6-in. pipe columns, each bolted to its footing by four anchor bolts of ½-in. and ¾-in. size. During the lifting procedure, but before the slab reached full height, the columns were noted to be 3 in. out of plumb to the east and the slab was cleared of about 60 spectators. Cable guys were rigged to columns in the outside bays to pull the columns plumb.

When the slab fell it landed about 15 ft west of its original position and was twisted slightly toward the south. Anchor bolts on two of the three columns visible after the failure were sheared off. The concrete fell on a truck parked alongside, completely demolishing it.

John P. Hall, president, U. S. Lift Slab Corp., patent owner of the lift-slab method of construction, after making an investigation of the failure, blamed it on these factors: (1) The design would not permit lateral loading without bracing during lifting; (2) the subcontractor had not braced in both directions; (3) the added live load of spectators possibly created irregular column stresses on the unbraced columns; and (4) the lateral shifting of the slab created an eccentric load which caused column failure.

Building plans, prepared by Vincent G. Raney, San Francisco architect, call for several more lift-slab roofs in the $1¼ million school project. Structural design was accomplished by the architect's staff.

The lifting was being carried out as a subcontract by Vagtborg Lift-Slab Corp., the West Coast Youtz-Slick licensee, headed by C. Henning Vagtborg, who was among the injured.

Vagtborg reported that more than a dozen other lift-slab jobs under way by his firm are proceeding on schedule. General contractor on the work is Swinerton & Walberg, San Francisco.

Cave-in halts work

300-ft. section collapses in Koolau traffic tunnel

Boring of the Koolau Mountain traffic tunnel at Honolulu, T. H., has been halted by a cave-in of a section almost 300 ft. long.

Tons of lose mud and rocks buckled steel ribbing used to hold up the roof and walls, but gave enough warning that all workmen were out of the shaft when it occurred.

Tentatively, the cave-in has been blamed on soaking of the earth by unusually heavy rains, but both the contractor, E. E. Black Ltd., of Honolulu, and the city-county of Honolulu are retaining special engineers and consultants to investigate and presumably help decide who should bear the additional cost involved.

At the time of the collapse, the tunnel, planned for 2,770 ft, had been pushed about 2,100 ft into the mountain range dividing Honolulu and its windward suburbs. The tunnel is clogged beyond the 1,800-ft mark.

Consideration now is being given to a plan to start work from the other end (the Honolulu side) and perhaps make an open cut for 300 or 400 ft, shortening the tunnel to 2,470 ft or less.

Big auction at Paducah

About $5½ million worth of materials and equipment will be auctioned off on Aug. 10 through Aug. 12 by the Atomic Energy Commission and F. H. McGraw & Co. at the AEC project site in Paducah, Ky. McGraw has been prime contractor on a cost-plus-fixed-fee basis. Value of the unused materials is estimated at $3½ million.

Materials and equipment can be inspected at the site from Aug. 2 through Aug. 9. A catalog and additional information can be obtained from F. H. McGraw & Co.'s Excess & Salvage Division, P. O. Box 749, Paducah, Ky.

Bidding close for contract to build $3-million Richardson Bay Bridge

Bidding was close for the contract to build the Richardson Bay Bridge near San Francisco. Duncanson-Harrelson Co., Richmond, Calif., bidding with Pacific Bridge Co., San Francisco, was low with a bid of $3,017,427.

Healy-Tibbitts Construction Co., San Francisco, was next lowest with a bid of $3,067,095. Ben C. Gerwick Co., San Francisco, bidding with Peter Kiewit Sons' Co. bid $3,127,983 and five other bidders went as high as $4 million. The California State Highway Department had budgeted $3.3 million for the job.

The half-mile-long bridge on U.S. 101 in Marin County just 5 miles north of San Francisco combines 225-ton piles with 80-ft-long precast, prestressed girders. The driven piles have the highest bearing capacity ever used in a California highway bridge and rank with the highest capacity piles in U.S. construction history.

As much of the bridge structure passes over a marshy area, the design aimed at minimizing on-the-site work. This led to use of heavy piles and precast, prestressed girders. Size of the piles depended on span between bents which in turn was based on the weight of a prestressed girder that could be economically lifted. Resulting design calls for bents of six piles each spaced on 80-ft centers. Spanning between each pair of bents will be 15 T-shaped prestressed girders weighing 40 tons each. With girders on 6-ft centers, this gives a 91¼-ft deck width which allows for two 40-ft-wide, 3-lane roadways plus walks and dividing strip.

Plans allow use of any one of six different pile types. The low bidder has not announced which type he will use. But the most favored in prebidding discussions seemed to be an H-pile made of plates welded together. One of the two types includes 18x1-in. flange plates and a 16x1-in. web plate. Piles average just under 100 ft long and are driven to solid end bearing.

The prestressed girders are T-shaped with belled bottoms. Depth is 4½ ft; width of the T is 4½ ft; of the stem, 8 in.; and of the bell bottom, 1¾ ft. No prestressing method is specified and the low bidder has not announced which type will be used.

Actually only a little more than half the bridge is decked with prestressed girders. A box girder design is called for at the south end where the bridge is on a curve and widens for an off ramp.

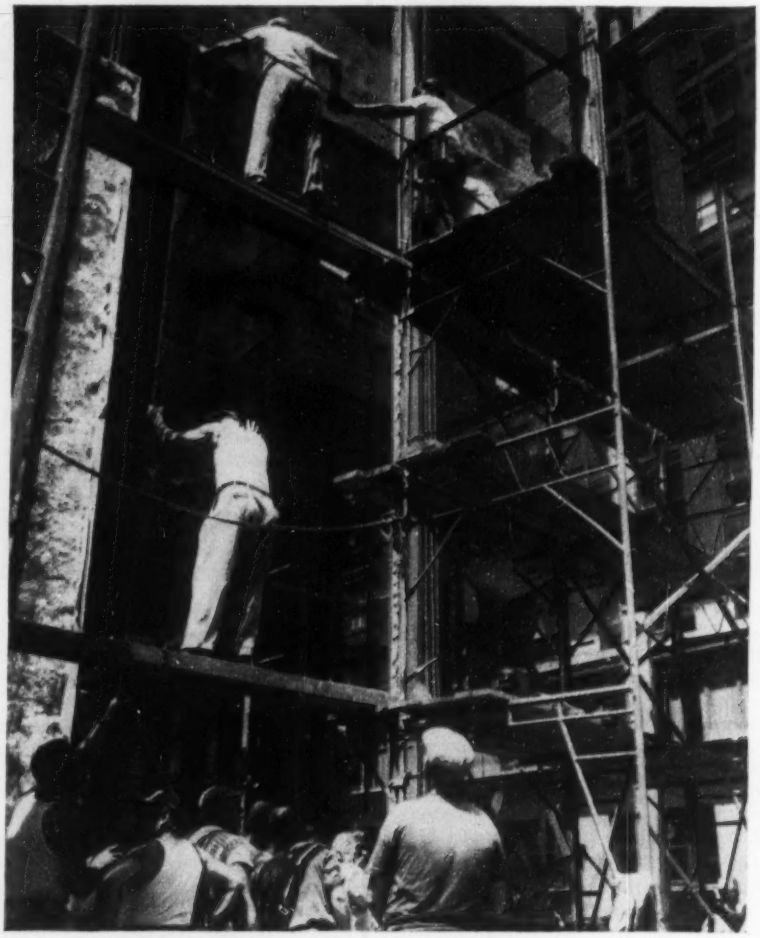
Of interest in the bidding is the fact that the low-bidder submitted the highest figure for driving the big piles. The amount was $1,000 per pile as compared with the second low bidder's figure of $325. This $160,650 difference for the 238 piles was more than made up by the low bidder's being one cent a pound low on reinforcing steel (8½ cents a lb as compared with 9½ cents a lb) and $5 a cu yd low on the two biggest classes of concrete. Low bidder's figures were $60 per cu yd for structural concrete poured on the job and $41 cu yd for prestressed girder concrete.

California gets estimates on highway widening job

The California Division of Highways had made preliminary estimates showing the cost of widening U. S. 40 to four lanes from Roseville, Calif., over the Sierra Nevada to the Nevada-California line would be between $42 million and $50 million. The distance is about 100 miles.

Business interests in California and state officials, including Civil Defense officials, have backed the project.

Last year the California legislature passed a bill to make available $20 million for the project provided the federal government put up a like amount.



No substitute for manpower on this job

It took 20 men with plenty of muscle to fit one of the largest sheets of glass ever cast in this country into place as part of the exterior wall of the Manufacturers Trust Company's new Fifth Ave. office in New York City. Sides of the $3-million, five-story building are composed entirely of glass panels set in steel and aluminum frames—a total area of 13,000 sq ft of glass (ENR Jan. 14, p. 24). Glass sheets are 9/16 in. thick. Twenty-two of them each measure 22x-10 ft, weigh 1,500 lb and cost $1,500. Others are half that size. The glass sheets were manufactured by Franklin Glass Co., Butler, Pa., and installed by Abbott Glass Co., New York. Skidmore, Owings & Merrill, New York, are the architects for the building. George A. Fuller Co., New York, is the general contractor.

Welfare plans gain hold in construction

Survey shows industry behind others—outlines general provisions of plans in effect—abuses ruled out

An ENR Staff Report

Although an estimated $4 billion a year pours into the coffers of health and welfare plans covering U.S. workers in all types of industry, a survey last week indicated that construction is well behind, but gaining on, the general parade.

That's not to say that construction employers aren't already contributing heavily in some areas; and that the 19 basic building trades unions aren't driving hard to get such plans written into their contracts. But a survey of the field by ENR's correspondent staff indicates:

- At least half of construction's estimated 4,000,000 workers are not covered by welfare plans.
- Nevertheless, construction's contributions—money-wise—to such plans may run as high as $126 million a year.

• Provisions reviewed—Further, ENR's staff reported that most of the plans in the construction industry fall into a pattern something like this:

- Average contribution (normally by employer only) 7½ cents an hour per worker.
- Average plan is a group insurance program, jointly administered by unions and employer groups.
- Benefits usually are not subject to collective bargaining, but are left to the boards of trustees.
- Most boards of trustees have shown themselves to be ultra-conservative, both by their awards and in their heavily "gold plated" investment policies.
- Almost without exception, administrative costs are found to be extremely small.

• Tough job—There are of course many reasons for slow progress in the construction industry: the itinerant nature of much construction work; the many divisions and subdivisions of contracting that employ labor; the seasonal nature of the work; the fact that no "national" industry exists as it does in steel or automobiles.

But labor unions, conscious particularly since World War II of an attrition in their ranks, have been driving for welfare plans (as well as pension programs) that they feel will offer the attractions of a career for younger men. Additionally, of course, the welfare plans have provided a point sometimes easier to obtain from employers than straight wages.

In general, the plans have gone into effect in almost exact ratio to the health of the construction industry: In large population centers first, in areas where a good deal of construction is going ahead now; and last in small population centers and largely rural areas.

• How much?—Just how many plans there are in existence now is nearly impossible to check—even the U.S. Treasury's Tax Division isn't sure, since many of the plans are self-administered, and are not registered with any official agency.

Just how much money is going into the plans isn't definitely known either—but some educated guessing can be done here. New York State's Superintendent of Insurance Alfred J. Bohlinger recently estimated a total of $4 billion going into welfare and health plans of all kinds nationally.

If you figure 63,000,000 workers, that works out to roughly $63 per worker per year. And for half of construction's workers, that comes out to about $126 million per year.

In a business that does a total dollar volume in the neighborhood of $36 billion (including maintenance and repair) each year, that's not a great amount. But it's an amount that is

(Continued on page 28)

Urges unions turn T-H against itself

AFL building trades head calls for flood of demands to NLRB, quicker strikes, to show need for change

American Federation of Labor construction unions are threatening an economic and legal war on the construction industry in their drive to organize workers.

Richard J. Gray, president of the AFL Building Trades and Construction Trades Department, reports that his organization's latest attempt to exclude construction unions from Taft-Hartley Act restrictions has failed. The only apparent recourse, he writes in the monthly building and construction trades bulletin, is to follow the "letter of the law."

To that end, he suggests:

- Construction unions, instead of seeking to bargain for representation should promptly funnel certifications for elections through the National Labor Relations Board. The high cost of such elections—estimated at $15 per man—could cause a serious drain on board funds and may prove that not enough funds are available for the agency to carry out its legal requirements.
- Where employers are refusing to grant organizing demands, the unions could move more quickly into strike action. "Employers who have opposed our simple request for relief might change their tune a bit if picketing for recognition were to interrupt their schedules," Gray warns.

• Amendment fails—The Building Trades Department issued its threats after reporting the Eisenhower Administration had turned down its latest Taft-Hartley proposition.

The proposal called for Congress to amend the labor law to exempt the construction industry from its provisions for a period of two years. During that period the Secretary of Labor would hold conferences with industry employers and unions to work out a new labor law or a separate section to Taft-Hartley to govern labor management relations in their field.

"We have been recently informed from high administrative sources that the Eisenhower Administration plans to do nothing in regard to this recent proposal," Gray says, adding: "Economic conditions will force our unions to do something more. . . ."

He notes the high pace of construction activity. Because of this, and a decline in other industrial activity, he says, thousands of workers are now moving into construction. But under Taft-Hartley rules, organizing these newcomers is beset with restrictions.

"The most potent weapons in our arsenal have not yet been used," according to Gray while urging his department's construction unions to consider strikes and legal action to make their demands felt.

growing every year—even though an occasional union contract foregoes welfare in favor of a cash raise.

• **How they work**—Without attempting to give a city-by-city tabulation, here's what was reported:

Payments almost entirely by employers range from a low of 5 cents per hour per worker to a high of 10 cents, but the vast majority hold at 7½ cents. Trustees of most of the plans seem to be agreed that rates should be held at about that figure, at least until the plans are old enough to make clear what financial coverage the trustees can buy for the workers out of the present financing arrangements.

Construction industry plans are usually of the insurance-carried type, rather than self-insured; with insurance companies and some banks becoming very active in the field.

Money being accumulated under the plans, incidentally, is not going exclusively for buying coverage and paying administrative expenses. At the moment, emphasis is being placed on creation of substantial reserves to assure stability and continuance of benefits in the future. Almost by common consent, most of the surplus is going into government bonds—and trustees have gone so far as to limit initial benefits to workers in order to build up what they consider proper reserves.

Eligibility requirements differ sharply from those of other industries. Usually, they require that the employe work a minimum number of hours during a specified period, for an employer who has agreed to contribute to the fund.

Variations occur on the number of hours and the length of the required period: Some plans are on a month-to-month basis, with the worker required to work 100 hours in the preceding month, to qualify for benefits. (As the plans mature, the tendency is to extend the period for eligibility to a quarterly, semi-annual or yearly basis.)

The clearest trend is in the direction of enlarging the group that is covered by a particular plan. The administrative and financial advantages of larger group plans is recognized by both employers and unions: Obviously expansion on a geographical basis (from local to city-wide, from city-wide to state-wide) brings in larger income, and could provide larger benefits, though it will increase expenses to some extent.

• **What is provided**—In a typical plan, the first protection is life and disability insurance, and hospital and surgical benefits for members.

From this base, the plans spread out in a number of directions. One of these has been the inclusion of dependents. On this point there's wide disagreement, with the preponderance of opinion against such inclusion. (One plan reported that out of a total of 1,812 hospitalization claims paid out, 887 were to wives and 521 to children of members.)

In addition to the basic coverage, many of the plans provide for accident and sickness benefits running from $20 to $50 per week, for 13 to 26 weeks.

• **Abuses?**—Conscious of the criticisms of such plans by many agencies—including congressional committees—most trustees went to some pains to point out to ENR the small costs of administration, and the eager interest of the trustees in proper administration of their funds.

ENR's survey turned up no evidence of abuses or corruption—on the contrary, most trustees interviewed said they were well satisfied that the plans are being operated well and honestly, and saw little prospect of corruption.

Most of the interviewers were agreed, however, that continuing interest on the part of trustees of both sides is a prime necessity.

Balk unemployed pay for job refusal

The Colorado Supreme Court in a recent decision refused to sanction unemployment compensation for a union carpenter who refused to accept a job for wages below union standards. The court's 5-2 decision reversed a Denver district court.

The carpenter—Jeff Willbanks—brought the district court action. He said he had accepted and worked at a job for two and a half days at an Estes Park ranch (in 1953) for $2 an hour, and quit when he did not receive pay for overtime work. Testimony indicated he later refused a re-offer of the job at the same $2 rate. The district court found in favor of his claim for unemployment compensation on the ground that the wages offered were considerably less than the prevailing scale at Estes Park.

But the Supreme Court said that the $2 scale was near the "prevailing scale" in the area, and found that evidence of possible overtime to which the carpenter might have been entitled was "too vague and uncertain" to support his claims.

St. Louis labor chiefs draw prison terms

Four construction trades union leaders—convicted early in the year for extortion from a contractor—had drawn heavy prison terms for their shares in the shakedown.

The U. S. District Court at St. Louis sentenced Lawrence Callanan, of the steamfitters and William Poster and Richard Secor, both of the laborers to 12-year terms; and Carl J. Bianchi of the hoisting engineers to a 10-year term. In addition, all four were placed on five years' probation at the end of their sentences.

The men were convicted late in February (ENR March 4, p. 29) of receiving $15,000 from an Oklahoma pipeline contractor as the price of labor peace on his job.

Labor briefs . . .

• **No strike pledge**—Chiefs of three labor unions whose members are working on Ohio's 241-mi toll road joined in a pledge to "try in every conceivable way" to avoid work stoppages of any kind. Teamsters, laborers and operating engineers were represented in the verbal pledges with contractors.

• **Reject offer on state work**—The State of Georgia has rejected flatly an offer of four construction unions to supply the state with labor for state capital improvement work, although the unions refused to supply labor to contractors who do not have a contract with the labor groups.

• **Ohio strike settled**—Two Ohio labor disputes have been settled—both with wage increases. Carpenters at Marion got a 25-cent-an-hour increase (to $3 an hour); asbestos workers at Toledo got 14 cents an hour.

• **Raise in Buffalo**—Lathers in Buffalo accepted a last-minute contractor offer of a total of 15½ cents an hour (by Oct. 1, to bring their wages to $3.24½ an hour).

• **Colorado developments**—A 7½-cent-an-hour wage increase (to $2.85) has spared the Denver area a carpenters' strike, and a 17½-cent hourly wage hike (to $2.95) ended the city's first sheet metal workers' strike in 45 years. But, two other striking unions, the operating engineers and the iron workers, have voted down offers for a 7½ cents an hour increase. The carpenters' new one-year contract for the first time provides travel time pay.

"I was promised delivery today,

but now I'm told you've no stock of one rope and only half enough of another. This delay is costing me money and plenty of it. From now on it's Roebling for me!"

* * *

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TWO MILLION YARDS OF

A section of the 16,000 unit Levittown, Pa., a complete city that will become the 10th largest city in Pennsylvania. All 16,000 footings and house slabs were batched to specification in Heltzel equipment. Other concrete requirements: 2½ miles of four-lane super highway, 320 miles of sidewalk, 160 miles of roadway.

The latest of four Heltzel Batching Installations used by Levitt in fashioning his famed Levittowns. This particular plant will have batched the greatest part of the 2,000,000 yards required in the Bucks County project.

SPECIFICATION CONCRETE

LEVITT RELIES ON HELTZEL BATCHING PLANTS IN RECORD SMASHING BUILDING PROJECTS

Every ounce of concrete—close to 2,000,000 "spec yards" — required to build the largest completely planned community ever attempted — Levitt's Bucks County, Pa., Levittown — was measured and batched by Heltzel Batching Plants.

Why? As Levitt's top construction engineers put it:—"We've used Heltzel equipment from the beginning. We've found their plants to be extremely dependable, fast and accurate. In many cases we've worked Heltzel plants around the clock — at a rate of 6,000 yards per plant per 24 hours. During one checking period we averaged out 317 yards per hour, batching five separate mix combinations."

Each of four Heltzel installations used by Levitt has posted an outstanding production record. The first installation, a 200-ton wedge type with skip hoist, used for cement block production, kept pace with Levitt's tremendous demands.

The second Heltzel installation, a 100-ton wedge type, three-compartment plant with two 100-ton bins carrying five-cubic-yard combination batchers, scored an impressive 2800 yards per day average. The third Heltzel installation included this original plant with the addition of a 300 bbl. per-hour cement elevator, a 126-ft. two-stage screw conveyer, a 30-in. belt conveyer and four 60-ton loading bins with belt feeder to charge aggregate compartments.

The fourth Heltzel installation is the plant (pictured left) now at work in Bucks County. It has already eclipsed all Levitt production records and, according to Levitt's plant superintendent, it is starting on its second million yards with the efficiency and ease of operation of a brand new plant.

Most every Heltzel user can give you similar testimony. The reason Heltzel Builds It Better — in all ways. If you are buying a plant for long range operation, for accuracy, for high production, you just can't beat a Heltzel. Write for additional data, ask for bulletin K-37 and P-21.

THE HELTZEL STEEL Form and Iron Company

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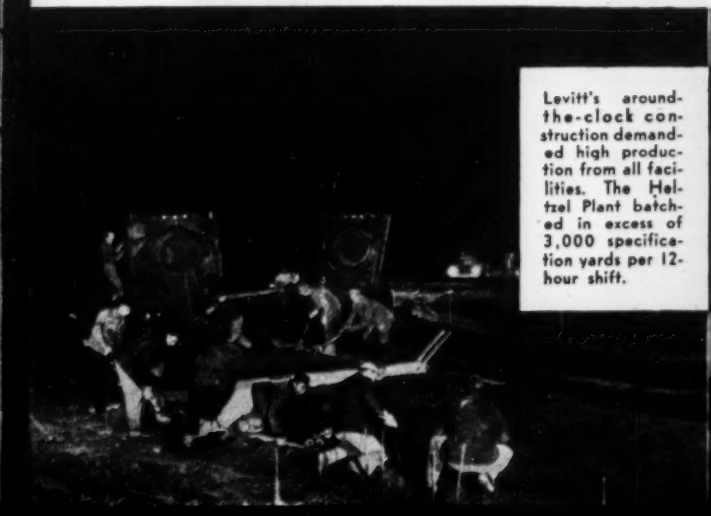
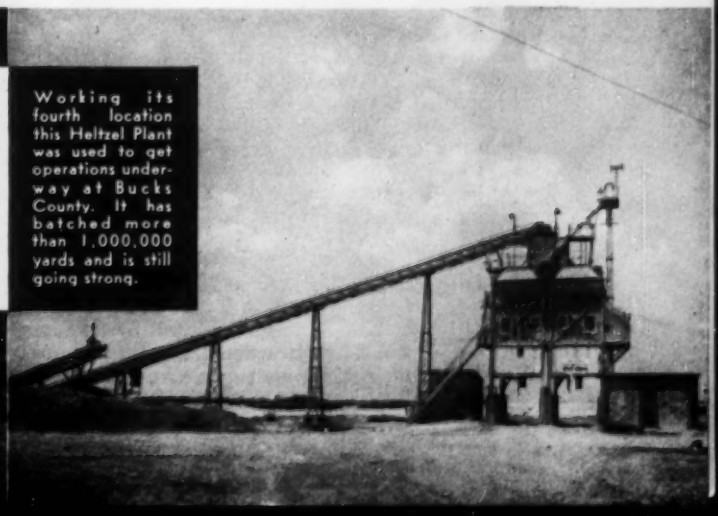
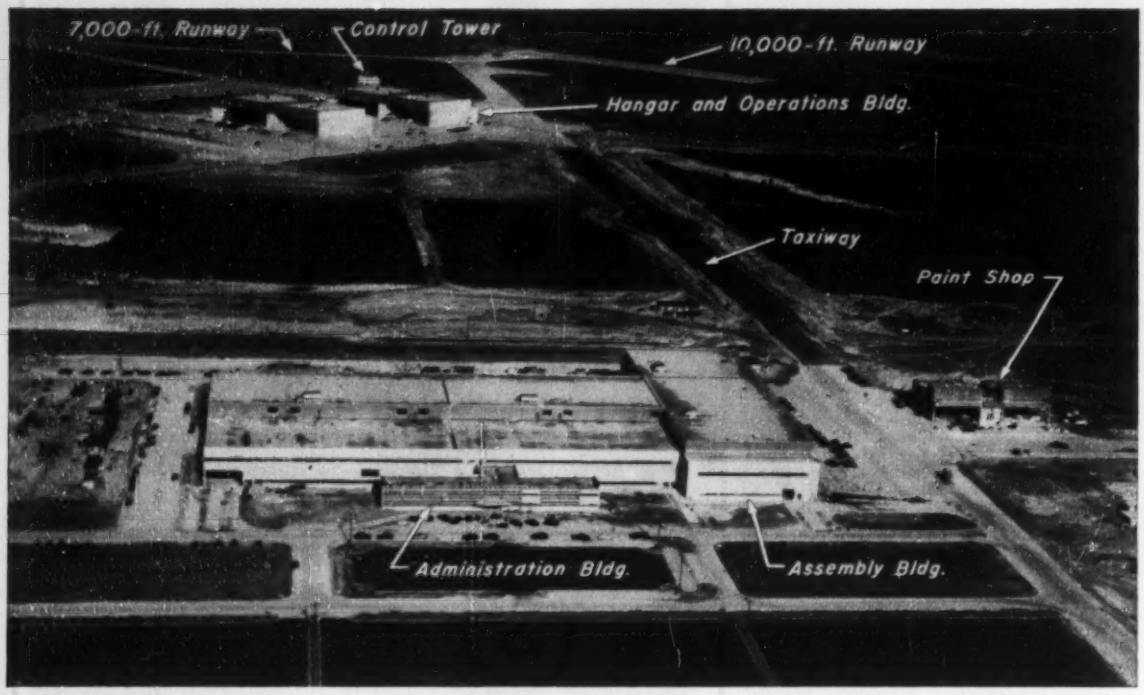


Levitt's around-the-clock construction demanded high production from all facilities. The Heltzel Plant batched in excess of 3,000 specification yards per 12-hour shift.



Working its fourth location this Heltzel Plant was used to get operations underway at Bucks County. It has batched more than 1,000,000 yards and is still going strong.



MAJOR BUILDINGS at Grumman's new plant on Long Island, N. Y., are close to runways, needed acoustical treatment.

Jet-plane plant keeps out the noise

Sandwich walls and double glazing exclude racket of engine testing on runways outside huge new assembly plant

When Grumman Aircraft Engineering Corp. decided to build a new assembly plant for jet aircraft for the U. S. Navy, it was faced with several problems in addition to those a company normally encounters in choosing a site and selecting building materials for new production facilities.

These problems arose because Grumman has to test its product. Thus, a two-runway airfield had to be built in conjunction with production and test buildings, and steps had to be taken to keep out engine noise when jet planes are tested.

In fact, it was because of the potential high noise level, as well as the safety angle, that Grumman decided its expansion should take place elsewhere than Bethpage, L. I., the congested area in which its present plant is located. So the company started to look for a site in regions with low population density.

• **Picking a site**—But then two thought-provoking questions were raised: If a new plant is to be built in sparsely-populated area, would construction labor be available—especially masons, who are in short supply nearly everywhere? And if noise is a nuisance to people miles from the source, isn't it also disturbing to workers in the plant itself, thus slowing production?

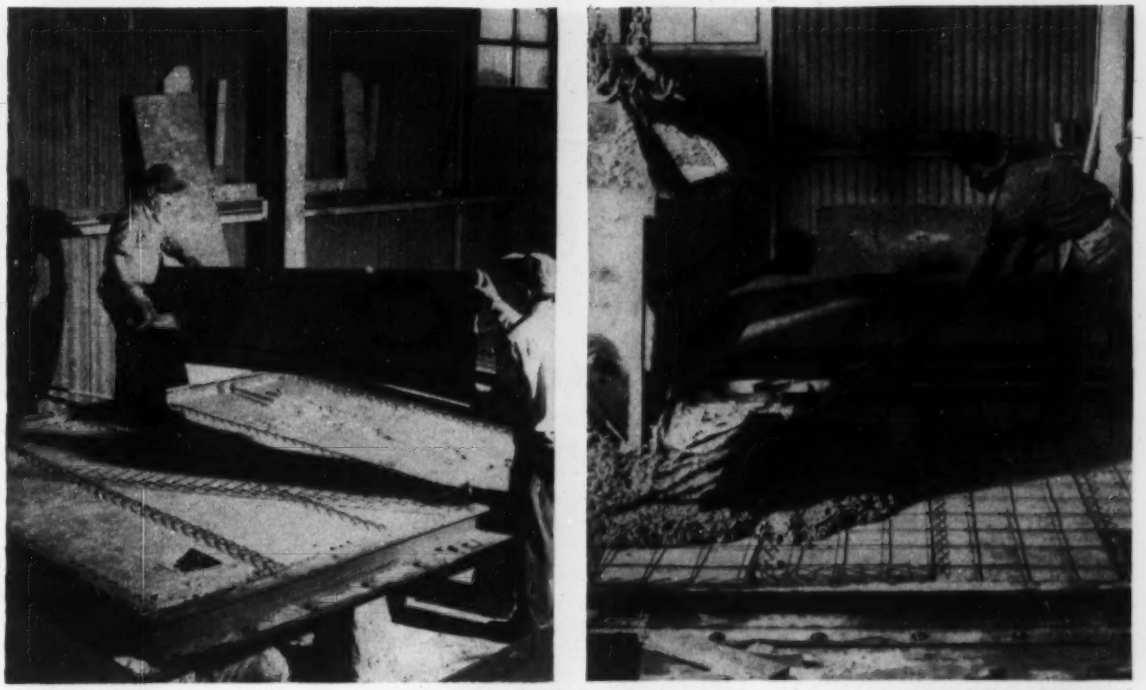
With these questions in mind, Grumman finally selected a 4,500-acre site in the Peconic River area near Calverton, about 50 miles east of Bethpage, and near the east end of Long Island. Because of the location and size and the heavily wooded, sound-absorbing terrain, chances are good that test noises will not greatly inconvenience nearby farming and residential areas. Moreover, the site is within economical shipping distance from the existing plant, where the company's main subassemblies are being manufactured.

• **Main buildings are big**—On this site, Grumman built two long runways for testing jet planes—one 10,000 ft long, the other, 7,000 ft—and several large buildings, enclosing about 19,000,000 cu ft of space and covering 527,000 sq ft of floor area. Total construction cost for the project is nearly $24 million. Major structures include an assembly and administration building, hangar and operations building, steam plant, warehouse and paint shop.

The assembly building is roughly L-shape in plan. One leg is 500x263 ft and the other, 465x143 ft. The longer leg is connected to a 225x45-ft, two-story administration building by a 40-ft long wing. Openings 120 ft wide by 36 ft high at the ends of the assembly building are closed off with sliding-type hangar doors that are metal-faced and insulated to exclude test noises.

The hangar and operations building is U-shaped in plan. One leg consists of a pair of 150x140-ft experimental hangars, with a 28x150-ft, three-story engineering and laboratory space between. The other leg contains a pair of production hangars and a three-story space for stockroom and offices. Hangar doors are insulated, and wrought-iron hot-water pipes are provided underneath the tracks to prevent freezing. The flight operation section occupies the wing connecting the two legs. The control tower is at one end, where it has overall view of both runways although it is closer to the main test runway.

The remaining buildings—steam plant, paint shop, warehouse, and small structures—contain less than



CONCRETE WALL PANELS WERE FABRICATED 50 miles from the site. After concrete inner facing, with shear ties protruding, was placed in the form, 1½-in.-thick glass-fiber board was set on top (left); then the concrete outer facing was placed (right).

15% of the floor area included in the project. All have structural steel frames—chosen because of the long spans involved and necessity of speedy erection.

I. Buildings made quiet

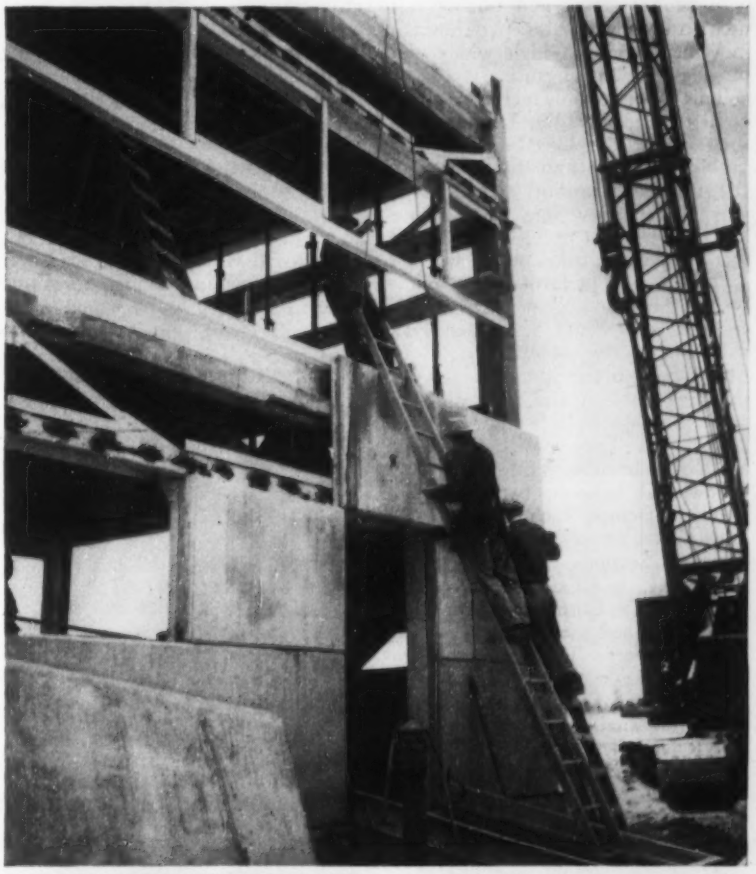
To prevent noise from penetrating into the buildings, the designers decided to insulate walls, roofs, hangar doors and windows.

In general, windows were installed only where daylighting is desirable, such as office spaces and the cafeteria area. In addition, for psychological reasons, windows were placed along the ground floor of the assembly building. In office areas and the control tower, the openings were double-glazed for additional insulation against noise.

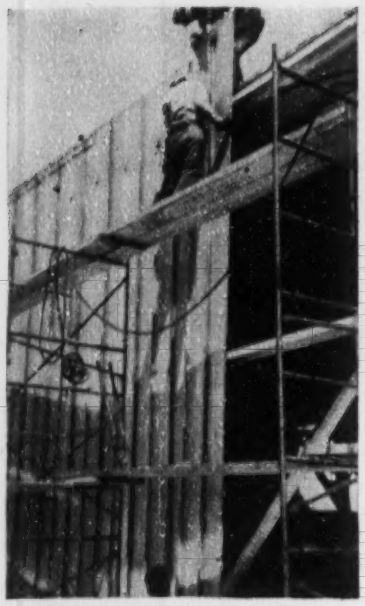
In the control tower, double glazing consists of an outer, ¼-in.-thick pane of heat-absorbing glass and an inner pane of ¾-in. plate glass, separated by a 4-in. insulating air space. Deep pile carpeting on the floor and an acoustic ceiling provide additional sound absorption.

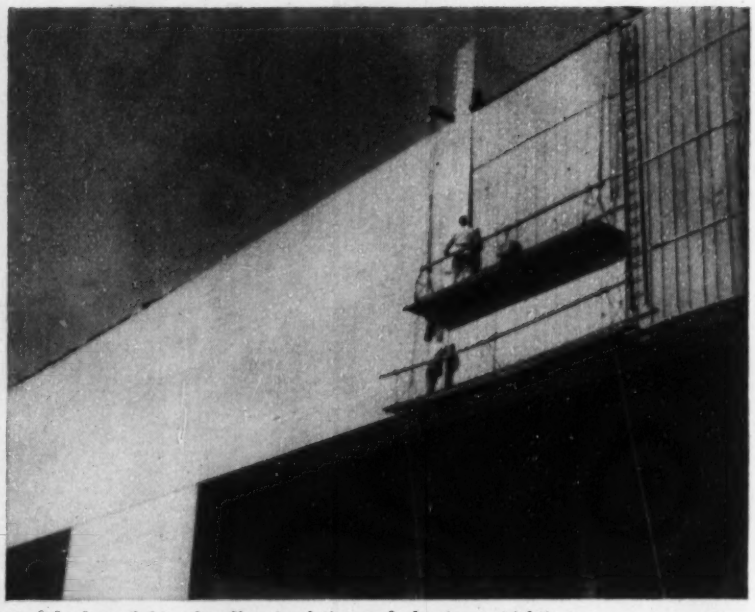
Roofs of the main buildings consist of 2¾-in.-thick concrete plank topped with glass-fiber insulation board and builtup roofing.

• **Sandwich walls**—Three types of wall construction were selected for building exteriors. The basic panel, generally employed up to the bottom chord of roof trusses, is a precast concrete sand-



ERECTING THE CONCRETE PANELS was a simple job with a crane that picked them from a delivery truck and held them while they were bolted to the steel frame.





METAL SANDWICH WALLS consist of steel backup (left), glass-fiber insulation and aluminum (right).

wich panel 5 in. thick, which is claimed to have a heat-transmission coefficient, or U-value, of only 0.14, compared with 0.36 for 12in. masonry. A tongue-and-groove type joint detail, with rubber gasket and calking was used to keep out water, permit small movements due to high winds and provide erection tolerance.

This panel not only met the requirements for acoustical and thermal insulation but also solved some of the problems arising from the location of the site in a labor-short area. A crane and a small crew were said to have proved equivalent to 72 masons. Also work could be carried out in weather that would not be favorable for bricklaying. And the bulk of the materials for the panel could be produced locally: they were manufactured about 50 miles from the site.

Panels vary in size, but most of them are about 8x10 ft and weigh two tons apiece. They consist of a 1¾-in.-thick glass-fiber-board insulation core sandwiched between two reinforced concrete facings, each about 1½ in. thick. They were fabricated by Precast Building Sections, Inc., New Hyde Park, L. I., in association with Marietta Concrete Corp., Marietta, Ohio, which supplied metal forms and advisory services. The technique employed was developed originally by Marietta and Ford Bacon & Davis, consulting engineers, New York City (ENR Jan. 24, 1952, p. 34).

U-bars were cast in the top of each panel for handling by crane. Also inserts were provided to enable the units to be bolted to the building frame.

Three tractors and six trailers were sufficient to keep a supply of panels on hand at all times without tying up tractors. At the site, cranes lifted the units into place directly from the trailers and held them while bolts were inserted and tightened from the inside of the building. In this manner, an average of 2,000 sq ft of wall was erected daily.

A total of 170,000 sq ft of these sandwich panels was installed at a cost of $2.97 per sq ft. Of this $0.85 went for delivery and erection.

• **Girt design**—Cost of the steel girt system supporting the concrete panels vertically and horizontally amounted to about $0.75 per sq ft. Calculations indicated that for full wind load over the wide column spacings horizontal deflections of the girts would prove excessive. Hence, girt connections to columns were designed as semi-rigid to keep deflections low.

Another feature of this design is that girts were so arranged that every 20 ft of wall vertically is independently supported, making possible removal of certain panels without disturbing the entire wall. To accomplish this, diagonal hangers were introduced at third-points of the girts to carry wall loads directly into the columns. Sag rods also were installed, as usual.

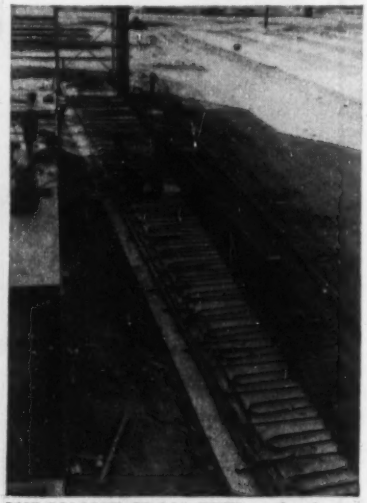
• **Other types**—A second and lighter weight wall unit was used for the exterior above the bottom chord of roof trusses. Since these panels could be easily removed when desired, they were also employed in locations where walls would have to be removed to permit future expansion of the buildings.

In the locations in which these panels are used, they will not be subject to damage, as they would be at grade.

Fabricated by the H. H. Robertson Co., of Pittsburgh, the panels consist of a fluted aluminum exterior facing, glass-fiber insulation and a smooth light-gage steel backup. The components were assembled in place on the buildings. About 100,000 sq ft was installed at a total cost of $2.60 per sq ft.

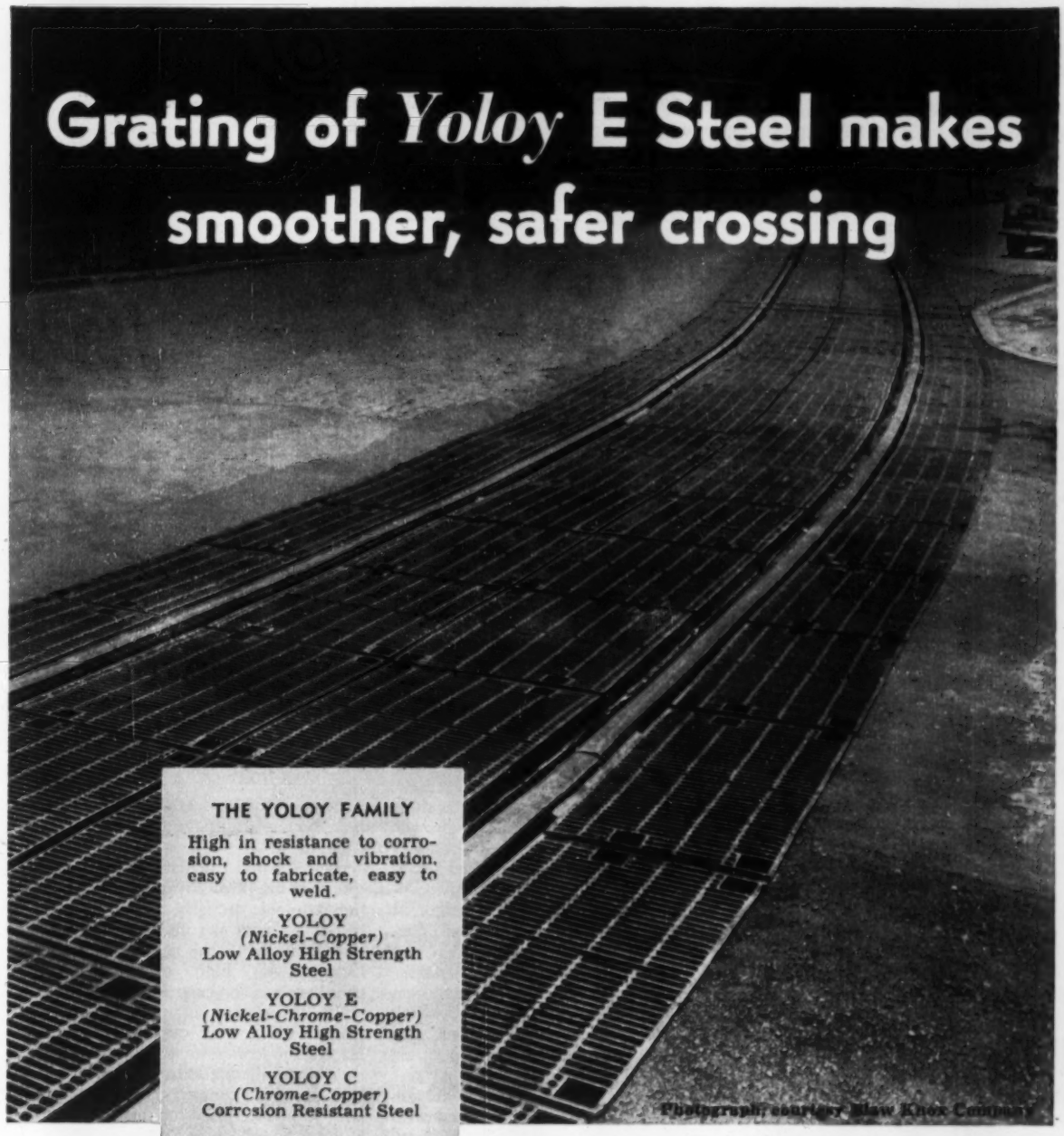
A third type of insulated wall was adopted for the administration building. Prefabricated by Seaporcel Metals, Inc., Long Island City, N. Y., it consists of laminated sandwich panels with an exterior facing of 20-ga anodized aluminum, a backup of 20-ga steel and 4-in. thick rigid cane-fiber insulation. Typical units are about

(*Continued on page 36*)



WROUGHT IRON PIPE under hangar doors will circulate hot water to melt snow.

Grating of *Yoloy* E Steel makes smoother, safer crossing



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Photograph courtesy Blaw Knox Company

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7 ft long by 5 ft high. About 3,500 sq ft were installed at a cost of $6.30 per sq ft.

• **Air conditioning**—With buildings equipped with fixed windows and designed for operation with closed doors in order to exclude noise, provision of air conditioning in office and work spaces was essential.

Air conditioning was accomplished by using both well water at 52F and mechanical refrigeration. Well water cools recirculated air, while the refrigerators chill supply air brought in from outside. The load distribution is approximately equal.

This split up was employed to keep the amount of well water needed to a reasonable quantity. (Irrigation is very important for farms in this area; so reduction of groundwater level is not desirable.) After it has cooled the recirculated air, this water is re-used as condenser water for the refrigeration unit. Then, it is returned to the ground through a recharge basin.

Ventilation of the paint shop presented a more difficult problem. Fumes and pigments that escape into the air during painting operations on the ground floor must be removed. The solution is to force the air toward one end of the painting floor where a continuous water spray was installed to wash the air before discharge to the outside.

Mechanical areas on the second floor of the paint shop are kept under a higher air pressure (with supply air brought in from outdoors) than the painting floor. So air always moves from the upper story down. Since explosive paint fumes cannot get up to the second story with this system, need for explosion-proof equipment in the mechanical spaces was eliminated —at a large saving in cost.

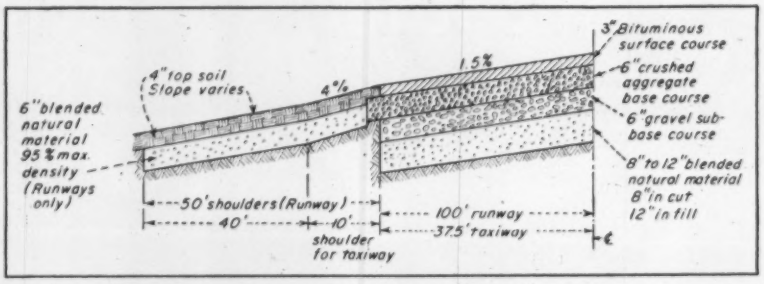
II. Pavement costs kept low

About 25% of the cost of the project went for site preparation, runways, railroad siding and related work. Grading for runways and taxiways required movement of 3,000,000 cu yd of earth, at a cost of $0.50 per cu yd. An additional 800,000 cu yd was moved to grade building areas at $0.95 per cu yd. Twenty scrapers, some tractor-drawn, some self-powered, were used for hauls up to about 1,500 ft, while an elevating loader and 20-cu yd dump wagons were employed for longer hauls.

A variety of equipment was adopted for compaction—50-ton compactors, 10 to 15-ton wobble-wheel rollers and sheepsfoot rollers.

The two runways were built perpendicular to each other, with a parking apron for visiting aircraft at the junction. The main buildings are inside the 90-deg angle, the hangar and operations building being set near the apex to give the control tower a good view of the runways.

CONCRETE PAVEMENT is a 10-in. thick slab on gravel subbase and subgrade. Expansion joints are spaced 45 ft apart, contraction joints, 15 ft.


3" Bituminous surface course
6" crushed aggregate base course
6" gravel sub-base course
8" to 12" blended natural material 8" in cut 12" in fill
4" top soil Slope varies
4%
1.5%
6" blended natural material 95% max. density (Runways only)
50' shoulders (Runway)
100' runway
40'
10' shoulder for taxiway
375' taxiway

ASPHALT PAVEMENT for runways and taxiways was placed in two layers on a three-layer base determined from extensive load tests.

• **Two types of pavement used**—Runways are paved with asphaltic concrete, except for a 1,000-ft length at each end, which is reinforced concrete. Plane storage, runup areas and aprons also are paved with concrete.

Asphalt pavement is employed on this project only in areas in which there is little likelihood of jet fuel spillage or of high temperature jet exhausts striking the pavement. Where jet exhausts were a potential regard, the concrete pavement was used with reinforcing mesh near the top to guard against particles being dislodged.

In the design, consideration was given to the very high tire pressures and small tire contact area of jet planes. As a result, the pavement should be adequate for landing the heaviest bombers, since these have lower tire pressure and larger tire contact area.

• **No extras for grading**—Extensive borings were made to determine subgrade conditions. As a result of the complete information thus made available, no extras were involved in grading operations for the air strips. Most of the borings were made with a post hole auger—and at a very low cost—by representatives of the consulting engineering firm.

• **Concrete pavements**—In order to provide a stable subgrade for the concrete pavement, the designers called for a 4-in.-thick blended gravel subbase on top of a compacted sugar-sand subgrade. This has a modulus of subgrade reaction, *K*, of 300.

The runway rigid pavement is a 10-in. thick slab with a flexural strength of 650 psi at 28 days. However, taking advantage of the gain of strength of concrete with time, the designers based calculations on an ultimate strength of 750 psi. To obtain the required strength, a cement factor of 7.2 bags per cu yd was necessary with the local aggregates used. Despite this high cement factor, shrinkage cracks have not developed.

The contractor set up a dry batch plant with a bulk cement silo and placed the concrete with dual drum pavers. About 66,000 cu yd, or 231,000 sq yd, of concrete pavement was laid. Concrete price for this work was $20 per cu yd, or $5.80 per sq yd.

About 45,000 cu yd of concrete pavement also was laid in building areas, but at a cost of $28 per cu yd. For this work, the contractor used truck-mixed concrete.

• **Asphalt pavements**—Prior to construction of the asphalt pavement, the engineers carried out an extensive load-test program. Trial sections were built in both cut and fill areas along the runways to determine what compaction and load-carrying factors could be obtained with local materials. Also, base courses of various thicknesses were constructed and load tests made simulating actual wheel sizes and loads.

(*Continued on page 38*)

Solve dangerous and expensive broken street problems by paving with *SOIL-CEMENT*

Dusty, muddy or dangerously potholed streets can be turned easily and quickly into clean, all-weather pavements with soil-cement.* The "before and after" photos above are striking evidence of this transformation.

Usually the scarified granular material of the old street constitutes the "soil" of the new soil-cement base. Since scientific controls were first developed 19 years ago to assure dependable soil-cement performance a long list of materials have been used successfully in soil-cement pavement. These include cinders, clay, caliche, sand, gravel, shale, slag, chat, marl, chert and scoria.

Converting worn-out streets into all-weather soil-cement pavement is quick and easy. Though scientifically controlled, the process is simple and construction and maintenance crews can learn the operations quickly.

Because paving is fast and simple and because about 85% of the required material usually is soil on the site, soil-cement pavement is economical. It's durable too. Practically all the soil-cement pavement built since 1935 is still serving in all parts of the country under temperatures ranging from 40° below zero to 100° above and under precipitation from arid to more than 60 in. of rainfall per year.

For more information about how to build this low-cost, all-weather pavement for residential streets write for free literature. It is distributed only in the U. S. and Canada.

* Soil-cement pavement consists of soil-cement base and bituminous surface.

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The tests led to selection for the lower layer of the subbase of an 8-in. layer of mixed sand and loam—both of which are native to the site—thus keeping down the cost of the pavement. Of excellent quality, this blend provided a California bearing ratio exceeding 30.

The upper layer of the subbase consists of 6 in. of gravel. Above this is a 6-in. crushed stone aggregate base course, which was mechanically stabilized and choked. The pavement is 3 in. of asphalt concrete placed in two layers.

The tests brought out a noteworthy fact: Even though a hot plant bituminous base course made with gravel had a Marshall stability over 1,500 and a flow value acceptable under most criteria, extensive and undesirable deformation of the base occurred when test loads were applied for a long period of time. That's why a crushed aggregate base course was specified for this project.

• **Trouble with the subbase**—The asphalt runway design used was excellent for construction during summer and early fall but not so in the late fall or winter, at which time the moisture content of the gravel subbase material could not be controlled or satisfactory compaction obtained. The difficulty with this gravel was that it readily absorbed water during rainstorms and retained it for a long time. Before the material could dry, another storm would soak it. When freezing weather set in, the water was frozen in the soil, necessitating reworking.

Another difficulty centered in the local aggregates used in the asphalt mix. Inconsistencies in the material made necessary continual variation in proportions.

• **Costs of flexible pavement**—About 70,000 tons, or 467,000 sq yd, of asphalt pavement was laid. Contract cost was $9.40 per ton, or $1.40 per sq. yd. For the 6-in. base, 77,000 cu yd of stone was placed at a cost of $7.80 per cu yd, or $1.30 per sq yd. The blended gravel subbase cost $3.90 per cu yd, or $0.65 per sq yd.

In the building areas, about 85,000 sq yd of asphalt surfacing was laid at a cost of $2.10 per sq yd. However, this pavement is not comparable to that used for the runways and taxiways, since much of the surfacing was for parking fields, which have an asphalt stabilized base with a double surface treatment.

• **Other noteworthy features**—The air strips will be lighted with high-intensity 200-w lamps spaced 200 ft apart on each side of the runways. Three electrical circuits serve each runway, each circuit being operated from a separate regulator.

Because of the rural location of the site, Grumman had to build two sewage treatment plants. One takes care of the hangar area, the other the assembly plant. Treatment equipment includes settling tanks with subsurface filter beds having dispersion chambers.

The designers also were faced with an unusual problem in arranging for drainage from the site, because of the necessity of maintaining run-off at a regulated rate into an existing privately owned pond south of the site.

To solve the problem, the designers extended drainage outlets from the building areas into the recharge basin for the air-conditioning water. An adjustable weir was then placed at the discharge end of this basin to maintain a constant flow of water to the pond.

• **Designers and builders**—The Office of Alfred Easton Poor and Seelye, Stevenson, Value & Knecht are architects–engineers for the project. Guy B. Panero is consulting mechanical engineer and Fred J. Biele, of Huntington, N. Y., consultant on water supply and sewage disposal. All but Biele have headquarters in New York.

Construction work was supervised by the 3rd Naval District Public Works Office, Bureau of Yards & Docks, New York City; Capt. J. C. Tily, officer-in-charge of construction; Cmdr. W. D. Bailey, resident officer in charge of construction.

Field inspection work in behalf of the Navy and Grumman was performed by the Thompson & Lichtner Co., Boston, Mass. For Grumman, William E. McKay is plant engineer and M. C. Papanek, project engineer.

Structures, utilities and attendant site work were constructed under a $13.6-million contract by Grove-Hendrickson, a joint venture of Grove, Shepherd, Wilson & Kruge and Hendrickson Bros. Harold Bower is project manager, and B. J. Connolly, general superintendent of construction.

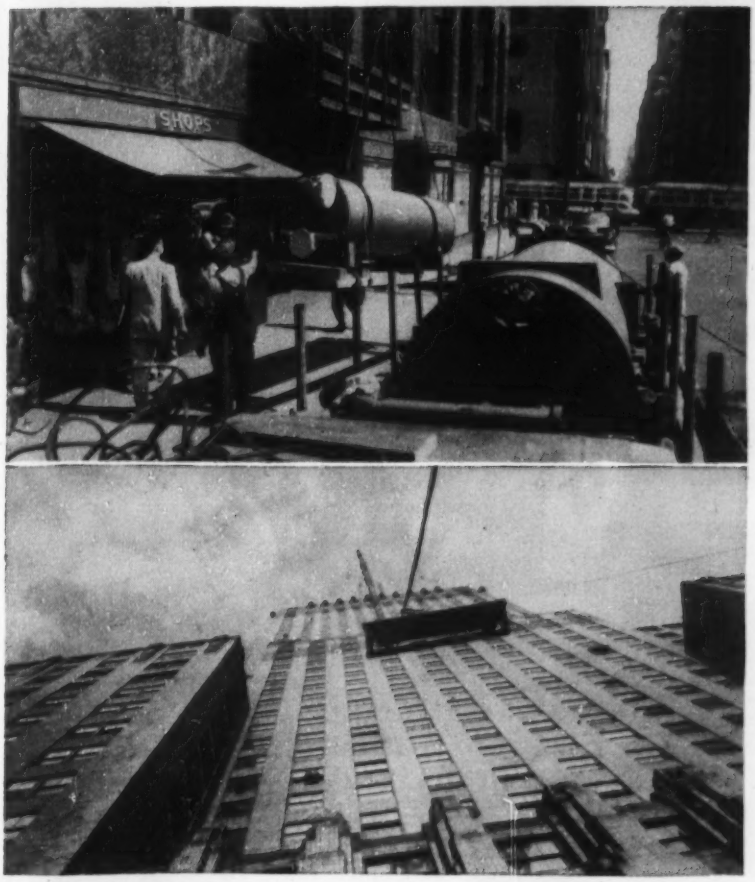
Runways, railroad and related work were built under a $6-million contract by L. J. Defelice, North Haven, Conn., Jas Grillo, project manager. Structural steel totaling 6,000 tons for the buildings was fabricated and erected by Bethlehem Steel Co. for $2 million. The project boilers, stokers, and attendant auxiliaries were fabricated and erected by Combustion Engineering, Inc., New York. Broadway Maintenance Corp., in cooperation with Chas A. Mulligan, Inc., handled the electrical work, which involved 3 miles of 66,000-v transmission line, an outdoor 66,000-v to 13,000-v stepdown substation, twelve 13,000-v distribution substations, and all interior wiring.

BOUNCER

Designed for study of radar wave propagation—by "bouncing" waves off celestial bodies—this 79-ton rig has been completed for the Army's Signal Corps Engineering Laboratories at Fort Monmouth, N. J.

The stand itself weights 65 tons, is a 26-ft high tower 15 ft square at the base tapering to 7½ ft square at the top. Each tower leg consists of two 5 in. by 5 in. by ½ in. structural angles. The 8 in. wf structural ring section is 17 ft 6 in. in diameter, used as a ring section to support the small radial trusses that form the antenna. This ring is in turn supported by a truss structure that itself rests on a reinforced box girder section, 19 ft by 7 ft by 4 ft, which rotates to allow the 14-ton parabolic reflector.

Engineering design was by Jackson & Moreland, Boston; erection by J. Feinberg & Son, Lakewood, N. J.



LOAD GOING UP

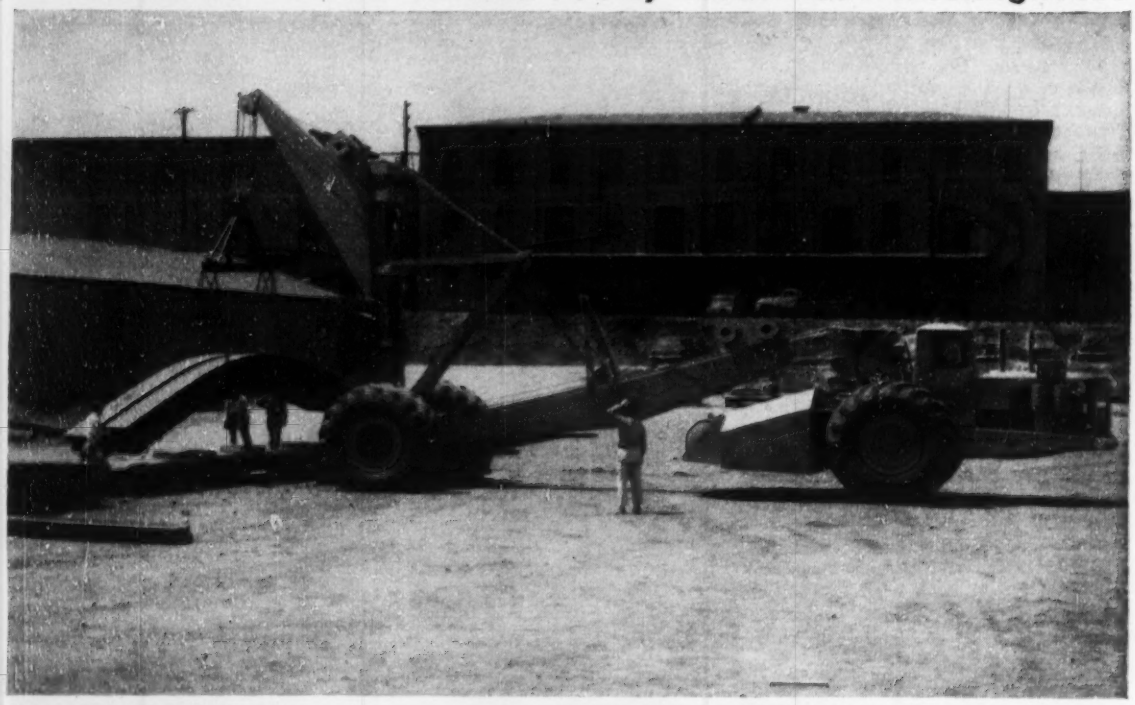
It was something of a toss-up as to who appeared to be more unconcerned—the experienced riggers or the pedestrians—when several heavy air conditioning units were hoisted up 54 floors on New York's skyscraping Chanin Building.

While a foreman used an Army field-phone to communicate with crew members on the building's 26th-floor setback and on the roof, riggers for Traynor & Hansen Corp., New York, attached absorption machines to a 500-lb ball-and-hook arrangement at the end of a boom mounted on the 26th floor. From that point, the loads were picked up by a second boom mounted on the roof, for final placement on the top floor of the midtown Manhattan structure.

The hoisting equipment had been separated into six 500-lb units so that it could be brought up to the two building levels by regular elevators, for later assembly and use.

(*Advertisement*)

Pictures of the month . . . by LeTourneau-Westinghouse



Bigger than it looks — That load may look small to you at first glance. But notice the men standing beside it. Actually, the lift totals 20 tons . . . and the Model A LeTourneau-Westinghouse Crane handling it can lift 40 tons without outriggers. An unusual feature of this crane is that it can transport any load it can lift. Big, low-pressure tires cross tracks, curbing, pavement, without causing any damage. Unit can load, haul, unload from any footing . . . even from unstable sand or soft mud.

Profitable 12 months a year — What's a snow picture doing here at this time of the year? Well, we hope it will remind you that LeTourneau-Westinghouse prime-movers provide the versatility to work all kinds of jobs year-around. Behind the same prime-mover, you can interchange a scraper, this rear-dump, a bottom-dump, flatbed, or crane. Rig pictured is one of 3 belonging to Rusciano & Son, New York City. Here, it is working on their New York Thruway contract for the Tarrytown-Nyack Bridge approach.

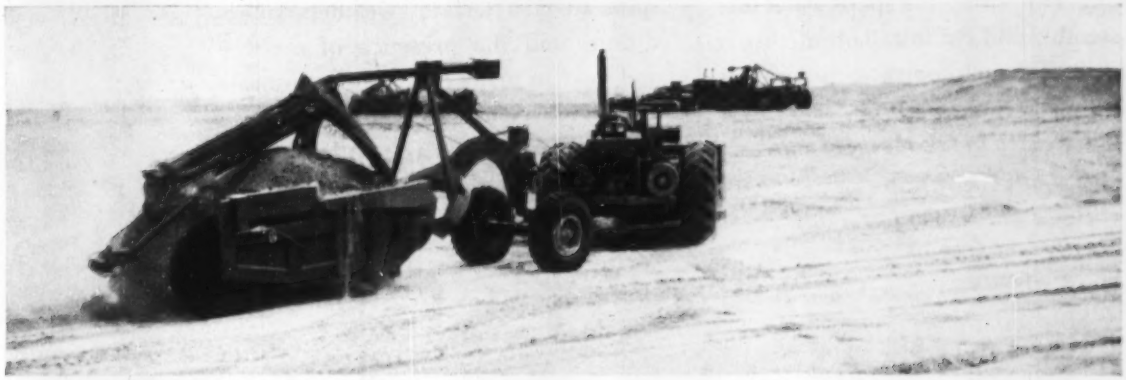
"Easier to sell its services" — Acme Paving Co, Boynton Beach, Florida, clears up to ¾ acre of tangled palmettos and palms per hour with this Tournatractor. "It's easier to sell Tournatractor's services than crawler's," says Sales Manager W. W. Rhody. "It does *twice* as much work, so the customer gladly pays $2 or $3 more per hour. It's the finest clearing tool I've seen!"

Built for easy maintenance — Simple trouble-free construction of every Tournapull can readily be seen from this field picture. Tournapull has no overhead cables, no hydraulic systems, no frame, no sub-frame, no springs to cause trouble. Photo was taken while unit, owned by Clarkson Construction Co, worked on a Missouri River bridge approach in Kansas City.

(*Advertisement*)

. . . with performance reports from around the world

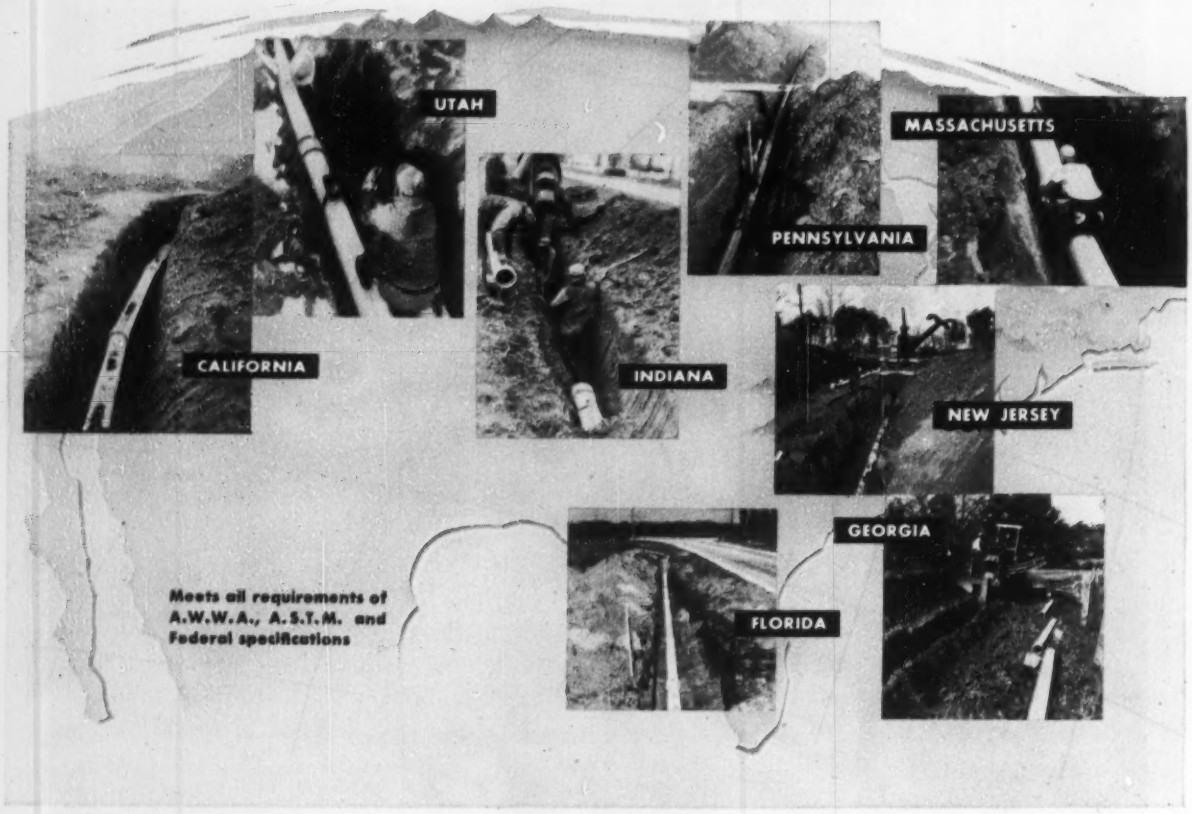
Joining the Americas — Dwarfed by mountains of Central America's Pacific Volcanic region, a rubber-tired C Tournapull hauls clay and rock for a 73-mile extension of the Pan-American Highway in Nicaragua. When completed, this all-weather road will be part of the overland route connecting South America and the United States. It also will be the first connection between Nicaragua's rich northwest farming area and the nation's capital of Managua. Hauling 1,800,000 cu yds of fill for the highway, 3 high-speed Tournapulls travel rough 2,000-ft cycles over grades as steep as 30%. Each delivers twelve 10-yd loads hourly.



Outproduces crawlers 80% — Harris and Allen, hauling 75,000 yds of gypsum for McPhaill Gypsum Co, Avenal Gap, California, report their Tournatractor and 11-yd pan outproduced a 148 hp crawler-tractor and 18-yd pan by 80%. Working same 1000 ft round trip, Tournatractor averaged 3 minutes per cycle . . . crawler 6 to 6.5 minutes. Tournatractor completed 17 trips per 50-minute hour . . . crawler, 8. Tournatractor moved 187 loose yds per hour . . . crawler, 104 loose yds. Both scrapers were self-loaded. For more information on tools shown on these pages, write LeTourneau-Westinghouse Company, Peoria, Illinois.

Tournapull—Trademark Reg. U.S. Pat. Off. Tournatractor—Trademark Pic 690-G

Setting new standards – everywhere...



Transite Pressure Pipe and Ring-Tite Coupling speed water line assembly, lower installation cost

IN COMMUNITY after community, proof that Transite® Pressure Pipe and Ring-Tite® Coupling speed water line assembly and cut installation costs is reflected in such contractor comments as these:

"Exceeded by far, the speed anticipated under job conditions."

"Based bid on 400 feet a day, actually laid over 700 feet."

"Established an entirely new concept of installation savings."

These new records for speedy installation have been accomplished despite adverse terrain, weather conditions and the presence of muck and mud in many of these locations. That is why, whatever your water line problem it will pay you to learn all about Transite's many advantages.

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Write for the new Transite Brochure, TR-142-A, Johns-Manville, Box 60, New York 16, N. Y.

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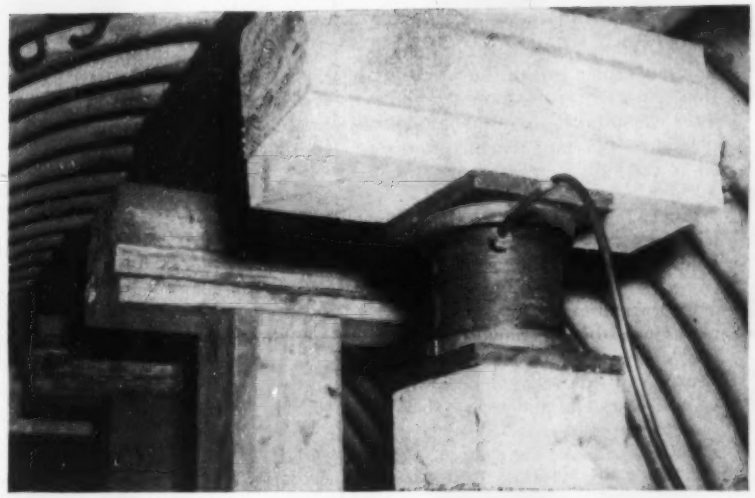


STRUT LOAD CELLS, placed at top of struts in culvert under center of fill, were made of short lengths of pipe with SR-4 strain gages placed around inner circumference.

COMPLETED EMBANKMENT 137 ft high dwarfs the culvert openings.

Corrugated culvert proves successful under pressures of 137-ft high fill

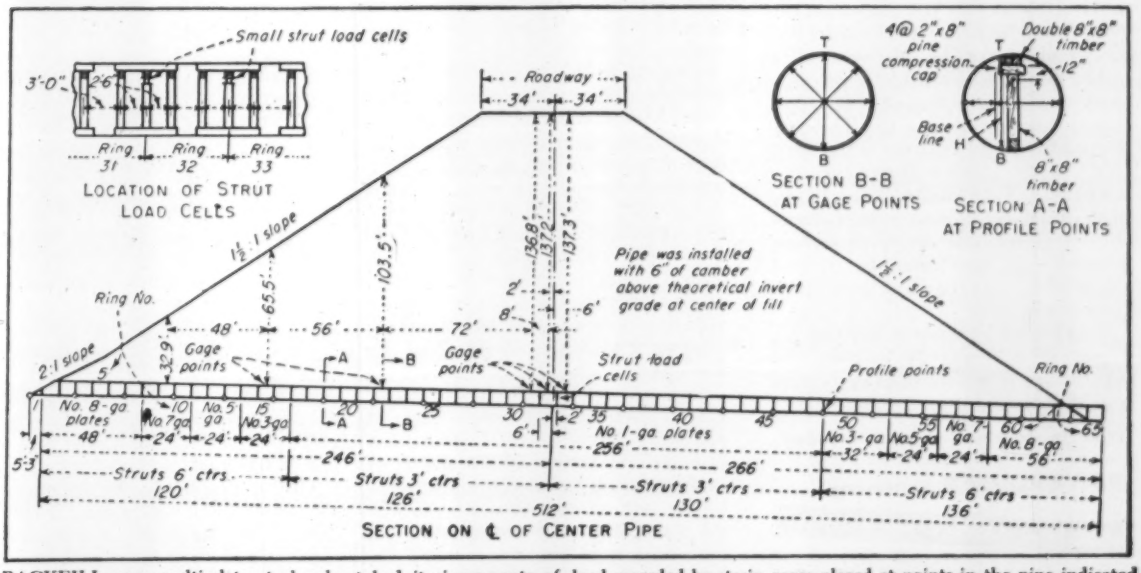
Corrugated multi-plate steel pipe culvert has demonstrated its capacities and given successful performance under an earth backfill 137 ft high at Cullman, Ala. (ENR Nov. 20, 1952, p. 38). The backfill carries U. S. Route 31 across Hurricane Creek at the bottom of a gorge whose depth—along with the size of flow in the creek—might as logically have called for a bridge.

Tests made on the three 7-ft dia pipes under the fill have shown that the roundness of the pipe is the same as it was after construction-stage struts were removed. The vertical load on the pipes approximates closely the weight of the vertical column of backfill immediately above each pipe.

Each pipe is 512 ft long, laid on a slope of 2.5%, and spaced at 20-ft centers. The corrugated culverts were laid with a 6-in. camber in the center (above the grade line between ends) and upon completion of the fill the culvert had subsided about 2½ in. in the center, leaving camber of 3½ in.

When the pipe culvert was laid, vertical diameter of the pipe was elongated by 3% through use of 8x8 in. struts placed at 3-ft centers in the mid-section of the pipe and at 6-ft centers at the ends. The accompanying drawing shows the gage thickness of the culverts and the positioning of struts used in the pipe while building the fill. No. 1 gage pipe in the center of the fill is 0.281 in. thick, and thin-

(Continued on page 44)



BACKFILL over multi-plate steel culvert had its increments of load recorded by strain gages placed at points in the pipe indicated.

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ning out towards the ends, the No. 8 gage pipe is 0.172 in. thick.

After completion of the fill and removal of struts, part of the 3% elongation remained in the pipe. In no case did the pipe reach its original vertical diameter. The pipe remains from ½ to 2½% vertically elongated.

• **Pipelaying method**—Prior to laying the pipe, a trench was excavated 2 ft below grade and wide enough to accommodate all three pipes. A bed of granular material was spread to correct grade for the culverts, and the whole trench compacted to 100% density over the valley floor, a mixture of boulders, sand and silt.

Before main backfilling began, selected material was placed around and above the pipes to a depth of 3 ft and compacted to 100% density with sheepsfoot rollers and the use of air hammers close to the pipe. Normal fill of earth, rock and sandstone was used above that, the material being placed in layers and rolled.

When the fill reached a height of 10 ft over the corrugated pipe, a trench 7 ft wide and 7 ft deep was cut over each pipe and then backfilled with loose uncompacted material before proceeding with normal fill operations for the rest of the job. This method of the "imperfect trench" was used to get an arched effect of the earth over the culvert to relieve any concentrated stress on the pipe during backfilling operations.

The use of the "imperfect trench" was only of temporary value, since the load on the culvert at the completion of the fill was substantially the same as that of the vertical column of earth above the culvert.

Loads were determined primarily through use of SR-4 strain gages placed in short cylinders of pipe to make strut load cells (see photograph), and also fastened to neutral axes of the plates at positions indicated in the drawing.

Analysis of the strain gage readings showed that greater loads were measured at points where fill material was repeatedly brought in over the pipe at one place. This "hard spot" in the fill material exerted more pressure than would the vertical column of earth over the pipe. In constructing large fills it would appear desirable to place material in horizontal layers and to compact it uniformly in order that the load may be transmitted evenly to the ground and culvert.

Data taken from the strain gages at successive stages of fill height show that each increment of fill added its load increment in direct proportion.

The research engineers who carried out the tests on the culvert point out that their tests did not measure the final stress condition of the pipe: pipes were strutted before the gages were installed. Levels of tensile stresses, induced by the strutting, were not known, and even though compressive stresses induced by the fill were measured, the final condition of pipe joints cannot be calculated.

• **Could use more data**—While sufficient data was available to design the multi-plate culverts for the high fill, the engineers believe that additional data would aid in using it more economically. The construction process used indicated that strength of pipe, compaction of backfill, and spacing of struts were all given proper consideration in the laying of the culvert.

H. D. Burnum, division engineer, and M. Curtis Davis, resident engineer Alabama Highway Department, supervised construction of the project. A. L. Crow Construction Co., Selma, Ala., installed the culvert, and Carlton Contracting Co., Albany, Ga., built the fill. The pipe was assembled by Armco Drainage & Metal Products, and the company has issued a research report on the job by John H. Timmers, metallurgist of the Armco Research Laboratories, Middletown, Ohio.

Long Beach, Calif., sued; oil fund rights questioned

In an effort to stop Long Beach, Calif., from expending $183 million in tidelands oil funds for municipal improvements, the city has been charged in the California State Supreme Court with violating the 14th Amendment of the Constitution.

Action was filed "on behalf of all the people of the state of California," and was instigated by the Tulare County Farm Bureau and other taxpayer groups.

The brief was entered with permission of the court in connection with a suit begun a year ago by Long Beach taxpayers to decide whether or not accumulated funds from tidelands oil can be appropriated by the city, or must go to the state.

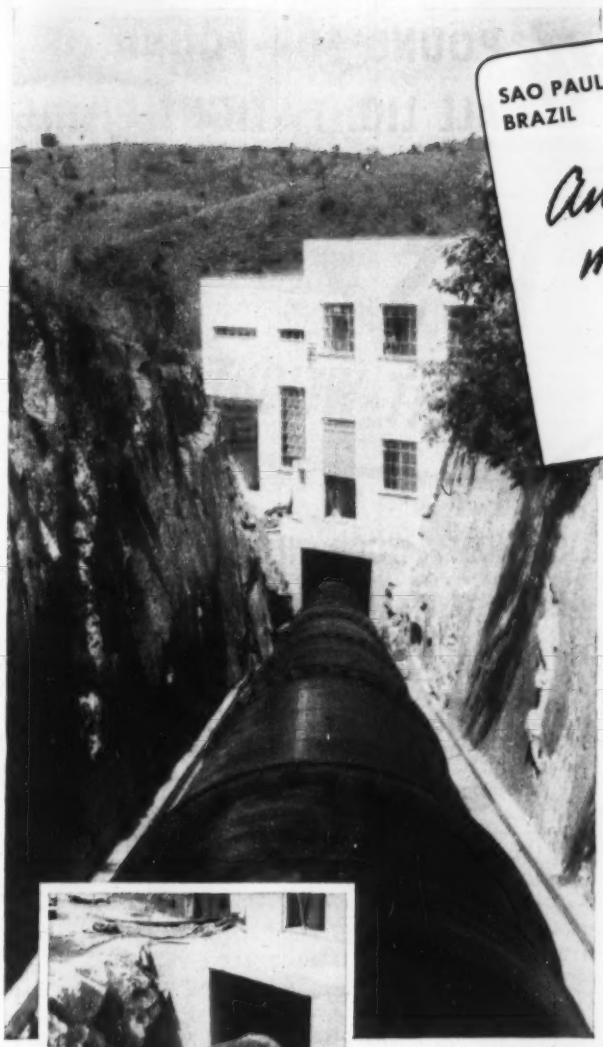
All property and money involved are trusts from the state and were to be used for development of Long Beach Harbor, the brief states. Since then, the legislature has rescinded all but 50% of the funds on the grounds that the harbor has been completed.

"But Long Beach," it continues, "instead of returning the funds to the state treasury, has outlined a program of civic improvements ranging from parks to incinerators to be paid for out of the trust."

Unless the funds are returned to the state, the brief asserts, it would "deprive all the people of the state of California of their inalienable heritage and rights to these valuable lands."

SAO PAULO, BRAZIL

Another Penstock job made easier with DRESSER COUPLINGS



Above—Resting on a steep slope cut through rock, the penstock requires no complicated anchors or supports.

Left—72" O. D. Dresser Coupling nearest powerhouse . . . shop-tested to withstand 312# psi.

Project designed and installed by Sociedade Eletrotecnica Brasileira Ltda.

Penstocks, joined with Dresser Couplings, result in *earlier revenue* from plant operation . . . *continued revenue* from uninterrupted service.

This 72" penstock supplies water for the Cia. Nacional de Estamparia power plant, which services both industrial and residential areas near Pilar do Sul, in the State of Sao Paulo, Brazil. To make this construction job easier, speed its completion, engineers specified Dresser Couplings.

Where high heads are encountered, this type of construction has further advantages. Low-alloy, high-tensile steel pipe can be used, *saving up to 25% of total penstock weight.* Longer pipe lengths mean fewer joints, fewer anchors to prevent progressive creep.

Using Dresser Couplings, crews can make permanently tight joints without difficulty . . . even when working under the toughest field conditions. And the resilient rubber gaskets in Dresser Couplings eliminate problems of stress relieving, assure a virtually maintenance-free line.

BE SURE you get a *better, faster* penstock installation. Put high-tensile steel pipe and Dresser Couplings in *your* specifications.

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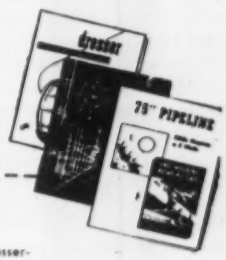

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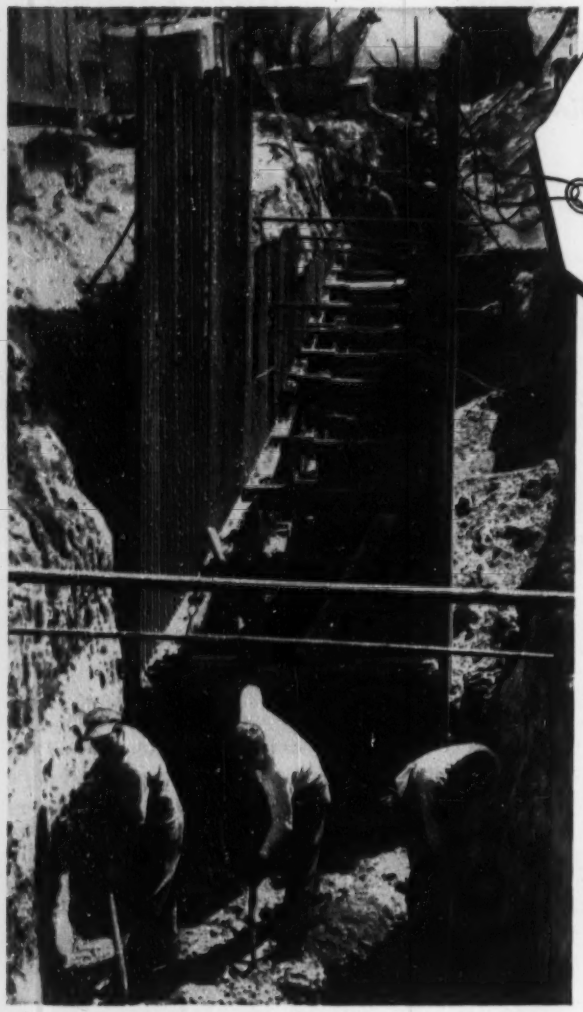

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LBF-1510	10	8.6	1.14
LBF-1208	8	12.9	2.38
LBF-1508	8	10.5	1.36

Foster H-S (High-Strength) Lightweight Piling is the ideal sheeting for your next pipe trench, or your building excavations, shore and pier protections, and cofferdams. It offers exceptionally *high section modulus* from its exclusive "High-Strength" Box-type corrugations—the only piling to combine such high strength with all the advantages of light weight. Light enough to handle by hand—drive and pull it by hand too. And, unlike wood, you can use and re-use Foster H-S Piling indefinitely. As the photo shows, it requires minimum bracing, and its high section modulus gives a stiff section for exceptionally easy driving.

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Rent all your Lightweight Piling needs on Foster's low-cost Rental Plan—get the exact length and section your job needs. Also all sections of Standard Heavy-Duty Steel-Sheet Piling available from L. B. Foster Co. warehouse or field stocks nearest you.

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TV tower has alloy-steel legs

Edward Cohen and Robert W. Hopwood
Ammann & Whitney, Consulting Engineers
New York, N. Y.

To provide reliable television service over a radius of 90 miles from station WTMJ, Milwaukee, transmitting screens were placed 1,017 ft above ground on a triangular guyed tower—tallest structure in Wisconsin.

Total height to the top of the service mast and surface beacon is 1,035 ft. Because of the sizable wind loads on this structure, high-strength steel had to be used in the legs.

Design is based on a maximum wind velocity of 75 mph 40 ft above grade and an exponential increase in velocity varying with the one-seventh power of the height. The design wind velocity on the top of the tower is 125 mph.

The corresponding pressures were applied in two ways: 75% was treated as a uniform load, the remaining 25% as a live load applied to produce maximum effect. It is interesting to note that a maximum wind velocity of 73 mph, the highest in over 50 years, was recorded in Milwaukee on Mar. 5, 1954.

Guys were designed for a safety factor of 1.67 applied to the elastic limit and of 3 to the ultimate strength. Guy anchors have a safety factor in excess of two based on the dead weight of earth and concrete. Tower members were designed without the increase in stress normally allowed for wind loads.

• **Solid legs**—The first design made for this structure called for a triangular tower with tubular steel legs 14 ft c-c and guys at two levels. Because of tube shortages, solid cylindrical bars had to be substituted. To make the most economical use of the available material, the designers reduced the basic side dimension to 10 ft and guyed the tower at three levels, 280, 560 and 840 ft above ground.

Tapering to a side dimension of 6 ft 4 in. at 870 ft, the tower projects 180 ft above the top guy. With the upper 130 ft covered with transmission screens having a large wind resistance, this cantilever is subjected to very high wind forces, which made it necessary for the tower to have high-strength legs.

A high-tensile, low-alloy steel—Mayari-R, supplied by Bethlehem Steel Co.—was used in the most highly stressed portions of the legs (yield unit stress: 53,000 psi). Diameters vary from 2¼ in. near the top to 7¼ in. just above the uppermost guy connection. All steel was chromate-treated and hot-dipped galvanized.

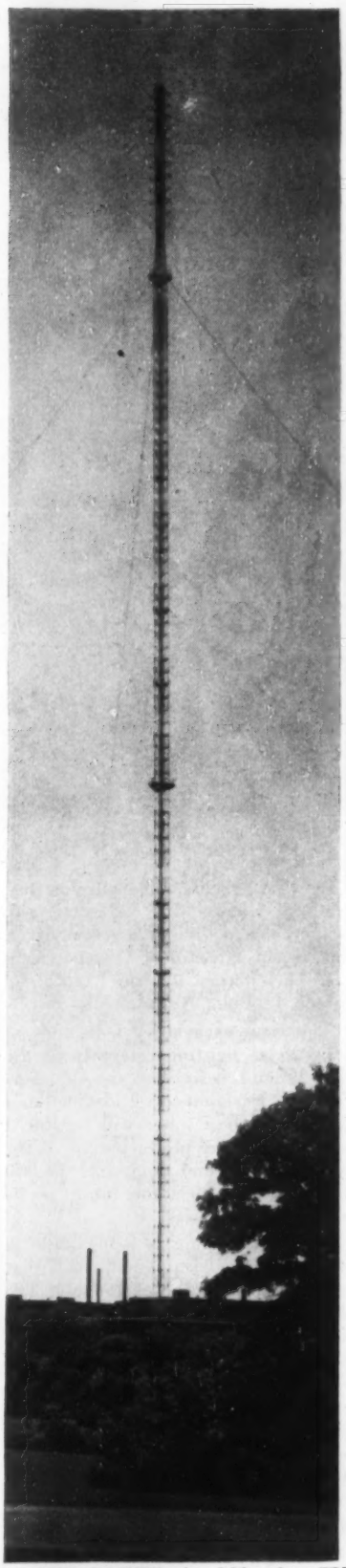
Guys at the top level are 1x147 galvanized bridge strand with a breaking strength of 784,000 lb. The guys at lower levels are 1x51 strand with a breaking strength of 232,000 lb.

• **Erection methods**—The tower was erected in 60-ft stages with a basket boom crane. Temporary 1-in. dia guys were installed midway between the permanent guys as the structure went up.

Fabrication and erection were facilitated by a simple bolted splice at all joints in the tower legs. Splices were made with heat-treated bolts having a minimum tensile strength of 125,000 psi, which were passed through rings welded to the ends of each leg section. The most highly stressed joints—those carrying more than 400 tons—were reinforced with plate stiffeners.

To conform with Civil Aeronautic Authority safety regulations, red flashing lights were installed at the top and third points. Telephone service and intercom stations were placed at all three lighting levels to expedite maintenance and repair work. Inside the tower also is a lift of 350-lb capacity with an operating speed of 100 fpm, which terminates at the 840-ft level.

Ideco Division, Dresser Equipment Co., Columbus, Ohio, was design engineer and fabricator. Ammann & Whitney, of New York City, were consulting engineers. Radio Corporation of America was the general contractor and electronic engineer. Tower Building Co., Wichita Falls, Texas, erected the tower.

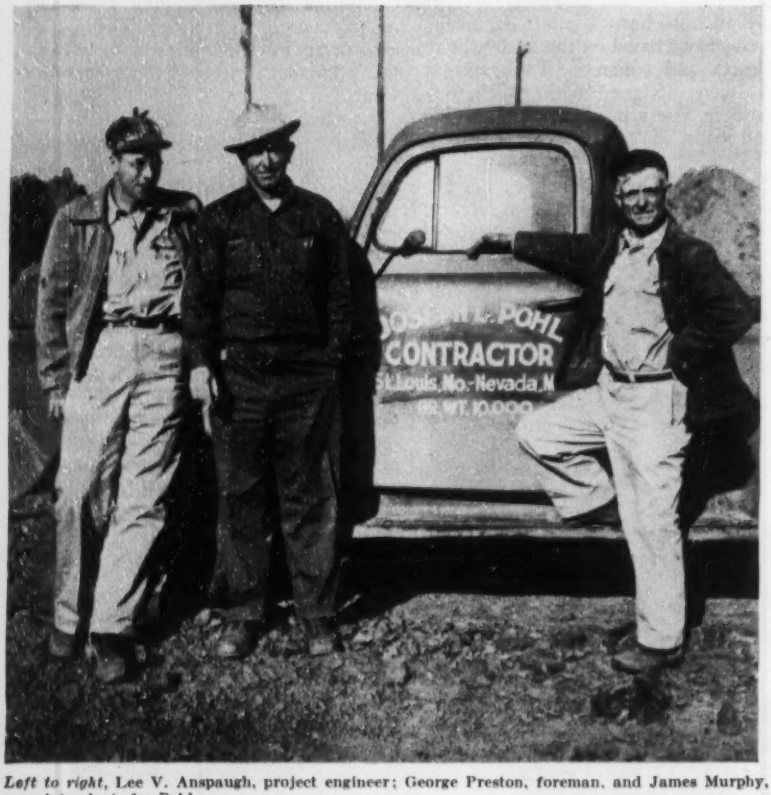


GUYED TOWER for Milwaukee TV station extends 1,035 ft above grade.

SOLID STEEL LEGS were spliced with high-strength steel bolts.

600,000 CUBIC YARDS OF BLACK GUMBO

Contractor finds Kansas reservoir job a challenge to men and machines



Left to right, Lee V. Anspaugh, project engineer; George Preston, foreman, and James Murphy, superintendent, for Pohl.

PART of a $12,000,000 expansion program of Kansas Gas & Electric Co. is the construction of a reservoir on the Neosho River near Oswego, Kansas. The contract is being handled by Joseph L. Pohl, Nevada, Missouri.

The new excavation will add 50 acres to an existing reservoir on the site. When it is finished, the old reservoir will be dammed off, drained and deepened. Here water will be stored for doubling the power output of the Neosho plant and providing 66,000 added KW to meet the future needs of southeast Kansas.

The earthmoving is being done in sticky, water-soaked gumbo soil that makes a tough job even tougher. The slippery ground offers very poor traction, and the earth balls up in the scrapers and buckets and clings to the bulldozer blades.

Nevertheless, the Pohl organization has stayed on top of the job and expects to complete it on schedule in November. One of the principal factors in licking these bad conditions is the use of Caterpillar* equipment.

There are ten Cat* track-type Tractors working on the reservoir—two D8s and two D7s pulling Caterpillar-

Positive ejection forces this load of wet gumbo from the No. 70 Scraper, pulled by a Cat D7 Tractor.

built Scrapers; two more D8s and two D7s equipped with bulldozers; a D8 used as a pusher and a D4 pulling a sheepsfoot tamper. In addition, a Caterpillar No. 12 Motor Grader works on the haul roads, and a Lorain dragline with a 2-yard bucket is powered by a Cat D13000 Engine.

Superintendent James Murphy says: "Caterpillar-built machines stand up under rougher treatment, with less expense, than anything else we have run across."

On nearly any job where conditions are especially tough, contractors count on these rugged yellow machines to pull them through. They're built to take it. Your Caterpillar Dealer can supply you with ample evidence of low costs for down time and repairs, big daily production and long, profitable work life.

The sheepsfoot tamper shown here is pulled by a Caterpillar D4 Tractor. In the background, powered by a Cat D13000 Engine, is a Lorain dragline.

•

In spite of the sticky going, the D8 with No. 8S Bulldozer handles a big blade load.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS, U. S. A.

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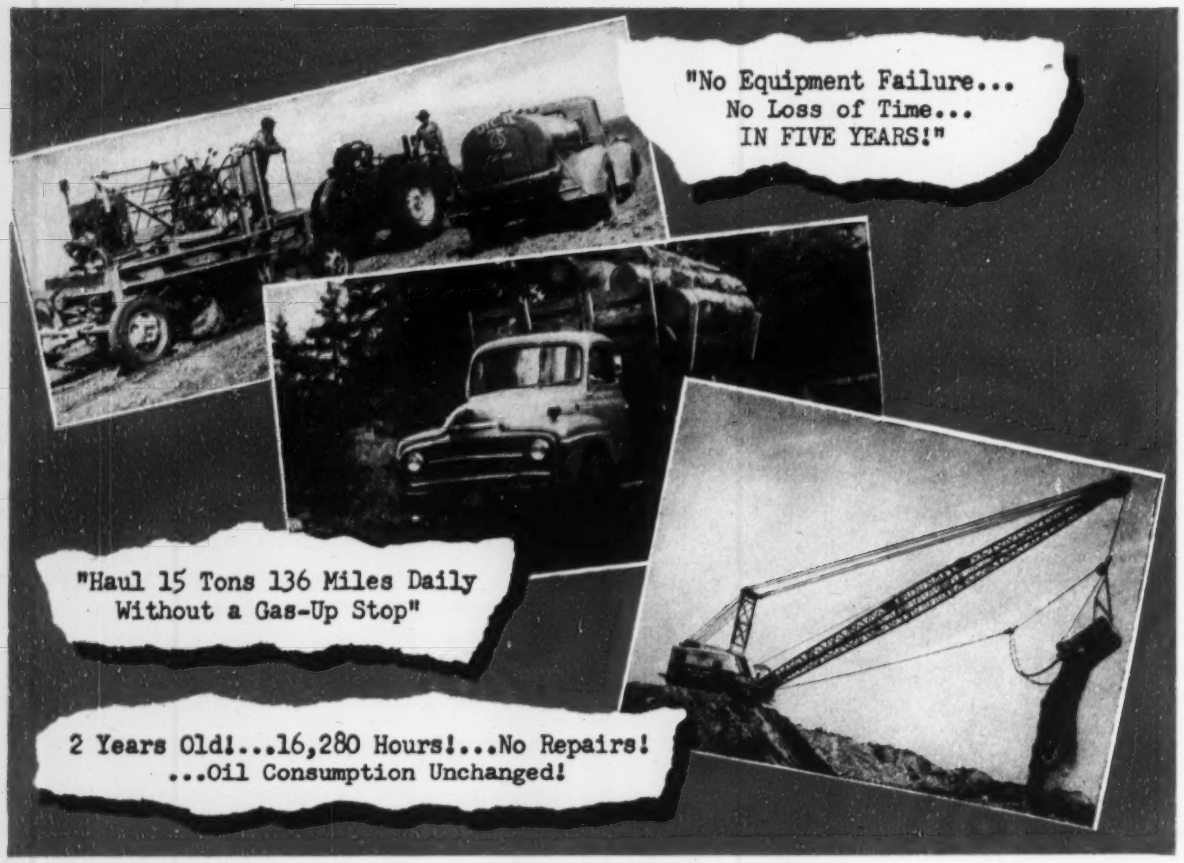
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Construction men report on equipment using Cities Service gasolene, oils, greases!

Above are excerpts of actual reports received from several different types of construction operations. They have been placed together on one page because they demonstrate very clearly that testimonials of unexcelled performance are the *usual* rather than the unusual when using Cities Service gasolene, oils, and greases. If there were room, many more could be added.

But no matter how many were added, they'd still tell the same story . . . a story of longer engine life, longer chassis life, fewer repairs, and far greater mileage and economy using the Cities Service line of highest quality petroleum products.

Whether you employ diesels or standard equipment . . . whether you use bulldozers, cranes, shovels, tractors, or heavy dump trucks, you'll find there's a Cities Service lubricant for every lubricating point on every piece of motorized equipment. Our job has been to make these lubricants . . . your job will prove they're better.

When you do business with Cities Service, it means you can buy everything from one source, save time in buying, and add dollars to your profit column. Try Cities Service one-source buying. Call your nearest Cities Service office or write Cities Service Oil Company, Sixty Wall Tower, New York 5, New York.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

Southwest city expands and spends as master plans grow with population

Albuquerque faces up to needs, begins $9-million program to convert itself to metropolitan status

Recent voter approval of seven general obligation bond issues totaling more than $9 million has launched Albuquerque, N. M. on a sweeping program of improvement aimed at keeping the city abreast of a wave of expansion equaled by few cities its size.

The bond issues: Public Library expansion, $150,000; Fire-fighting buildings and equipment, $375,000; Street improvements, $530,000; Civic auditorium, $250,000; Storm sewers, $1.95 million; Sanitary sewers, $1.9 million and water system extension, $4 million.

In the same election, Albuquerque voters rejected two tax proposals—an increase in the city's ½-cent-per-gal gasoline tax to one cent, and a cent-a-pack cigaret tax earmarked for park and playground improvements.

Aside from being one of the fastest growing municipalities in the U. S., Albuquerque is also one of the busiest. Its private and public building programs—extensive as they are—will hardly keep up with the mushroom growth.

Need for sweeping action developed when Albuquerque's rising population (1940 pop: 35,000; 1950 pop: 97,000; estimated 1953 pop: 140,000) spread the city's physical area from 11.25 sq mi in 1946 to more than 53 sq mi in 1954. Most of the expansion took place in the first three years after V-J day through a series of annexations.

• **Private enterprise**—Even the four-deck, $250,000 all steel parking building (ENR, May 8, 1952, p. 59), prefabricated and erected for the Clyde Moore Parking Co. by the Multi-Deck Corp., of Beverly Hills, Calif., contains built-in expansion features.

Located on a site just two blocks from the city's busiest intersection, the structure has three partly enclosed decks, plus one deck on the roof—but it was built so that two more decks can be added in the future.

The building, 100 ft x 142 ft, occupies the same block as two of Albuquerque's largest buildings—Hilton Hotel, 10 stories, and the eight-story First National Bank Bldg.

The recently opened facility is Albuquerque's first venture in major private parking enterprise.

• **Paving Program** – Continuing through 1954 is an accelerated paving program that in less than four years has produced more than 200 mi of new street surfacing at a cost of about $8 million.

Until 1950, most of the city's new pavement was laid by a small municipally owned paving plant that dates back to WPA days. The State Highway Department contributed a share to the widening and surfacing of main arteries, and in addition, laid light (1½-in.) asphalt paving in suburban areas later annexed by the city. Much of this light paving is now being replaced.

The surge in paving started in August, 1950, when the city commission voted to revive – after long disuse—a provisional order system of paving. Under the system, districts are set up; bids are invited; contractors are paid through issuance of paving bonds that bear 7% interest and that are retired through special assessment against benefited properties.

Owners of improved properties are given the option of paying lump sums at a substantial discount, or paying semi-annual installments over a 10-year period.

• **Reluctant financing**—City Commissioners had been reluctant to use this method of payment because of "paving scandals" that were attributed to it during the late 1930's in a number of New Mexico municipalities.

Paving programs had been pushed during the booming 1920's, and the depression brought so many lagging collections that the courts were clogged with lawsuits filed by paving bondholders. Foreclosure failed to produce enough money to meet bond requirements as real estate values skidded to all-time lows.

While the courts criticized municipalities for not fully enforcing terms of their paving trusteeships, thousands of bondholders lost their money. The courts ruled that cities could not be held liable for the paving bonds because the bondholders had recourse through filing their own foreclosure suits—but for most of the bondholders, statutes of limitation had run out.

Additional amendments to the state's paving law have been written,

(Continued on page 53)

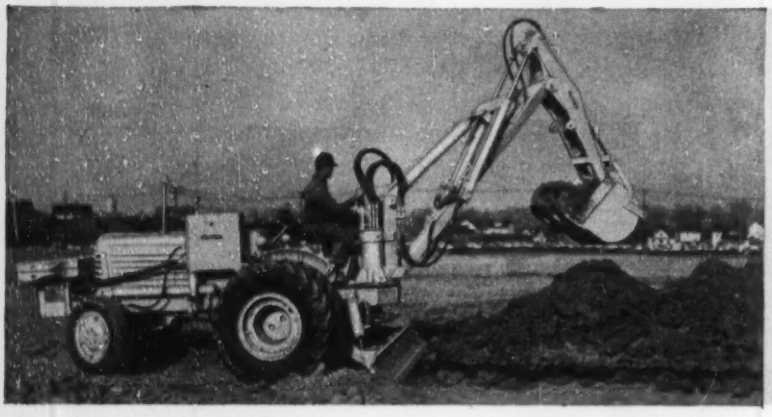
JUST THE BEGINNING—Even this parking structure was designed for expansion to six stories (seven levels), in anticipation of future needs.

Hydro-Trencher puts the squeeze on tough soil!

Working in conditions like this won't slow down the Oliver 88WT Hydro-Trencher. It digs through rocky soil, roots or hard clay fast and clean. Hydraulic down pressure does all the work. The bucket is *forced* full in the toughest going. Two completely separate hydraulic circuits keep pressure on every maneuver, even when you perform two operations at once. You've got working power all the way—to speed your work, to boost your production.

A one-man rig, the 88WT is ready to work or move in a moment. Its half-yard capacity and rubber-tired mobility cut hours and dollars from any job. Its compact design and delicate hydraulic control let you work next to pipes, walls, foundations, without fear of damage. The rugged, hydraulic stabilizer blade holds the unit level and steady, and also doubles as a backfiller blade. And here's a bonus feature, turn the trenching bucket around, in minutes you have a swing loader with all the power features of the trencher.

For more profit, put the squeeze on your trenching or loading operations with the Oliver 88WT Hydro-Trencher. Visit your Oliver Industrial Distributor for a demonstration.



OPERATING FEATURES
OLIVER 88WT HYDRO-TRENCHER AND SWING LOADER COMBINATION

- **One-half yard bucket**
- **Digs to 10 feet (12 feet with optional boom cylinder)**
- **Loads to 10½ feet (12 feet with optional loading bucket)**
- **200° boom swing**

THE OLIVER CORPORATION
400 West Madison Street, Chicago 6, Illinois

a complete line of industrial wheel and crawler tractors

however, during almost all periods of legislation since 1930, so officials believe that there is ample statutory protection now for all parties concerned.

• **But it works**—To get its paving program going, the city commission hired the Albuquerque engineering firm of Herkenhoff, Turney & Associates as consultants. Since August, 1950, the firm has set up 25 paving districts totaling 185 mi to cost $7,262,798.

The latest of these projects, completed early in January, was a 13,390-ft section of four-lane paving on Lomas Blvd. NE, an important east-west arterial route extensively used as an alternate to Central Ave. (US 66).

At the completion of the $276,567 Lomas Blvd. project, the artery's width was 82 ft for 10,690 ft of its length with a median divider, and 66 ft wide for the rest of the route. The State Highway Department paid the cost of the divider, two of the four traffic lanes and one-third cost of the parking lane, curb and gutter work.

Plans are substantially complete for two new projects—expanding Wyoming Blvd. (leading directly into the north gate of Albuquerque's Sandia Base atomic installation) to four lanes, and the paving of an extension of 12th St. NW—both with state aid.

All paving is laid according to city specifications—five-in. asphaltic concrete consisting of a 3½-in. base course laid on a compacted, oil-sprayed surface, and a 1½-in. seal coat. Hot mixes are used in both courses.

In addition to the 185 mi paved by contractors under the provisional order system, the municipal paving plant has surfaced an average of about 10 mi of city streets per year.

Under the provisional order system, paving costs about $2.10 per sq yd. The city plant charges $1.50.

One factor that blocks more extensive use of the municipal paving plant, despite it lower cost, is that the city insists on 100% cash on the barrelhead before undertaking a minimum one-block project. The reason for this, city authorities say, is that there are no municipal funds to make installment-plan payments feasible. As a result, one absentee landowner can block a project.

• **Flood control program**—Long a "sitting duck" for a Rio Grande flood (ENR Mar. 6, 1952, p. 53), Albuquerque began action in April to defend itself against a second flood threat from a different direction—flash floods from arroyos to the east.

The flood protection job could cost $20 million to $25 million, with the federal government being requested to contribute an estimated $10.3 million to the project.

A newly created Sandia Conservancy (Flood Control) District recently awarded a $75,000 contract for a master flood control plan (ENR April 8, 1954, p. 24). The contract went jointly to Freese & Nichols, consulting engineers of Fort Worth, Tex., and to the Albuquerque Herkenhoff firm.

R. B. Waggoman, chairman of Sandia District's board of directors, said choice of the master-planning engineers was made from a dozen nationally known firms whose proposals ran up to a total of about a quarter million dollars.

Master plan work will consist of making detailed aerial and contour maps of the Sandia District, then planning a system of drainage ditches, storm sewers and other structures to control arroyo flood waters.

The district extends from Sandia Pueblo reservation, 10 mi north of Albuquerque, to the Isleta Pueblo reservation, 13 mi to the south; and from the Rio Grande eastward to the Sandia Mountains, embracing about 200 sq mi in all.

The district was created last year after nearly a decade of intermittent flooding caused by storm runoff boiling down the arroyos that drain the alluvial plain between the Rio Grande and Sandia Mountains. One such flood, in 1952, created damage in excess of $1 million.

• **Danger increased by building**—Arroyo floods have become an increasingly dangerous threat during the past decade for several reasons.

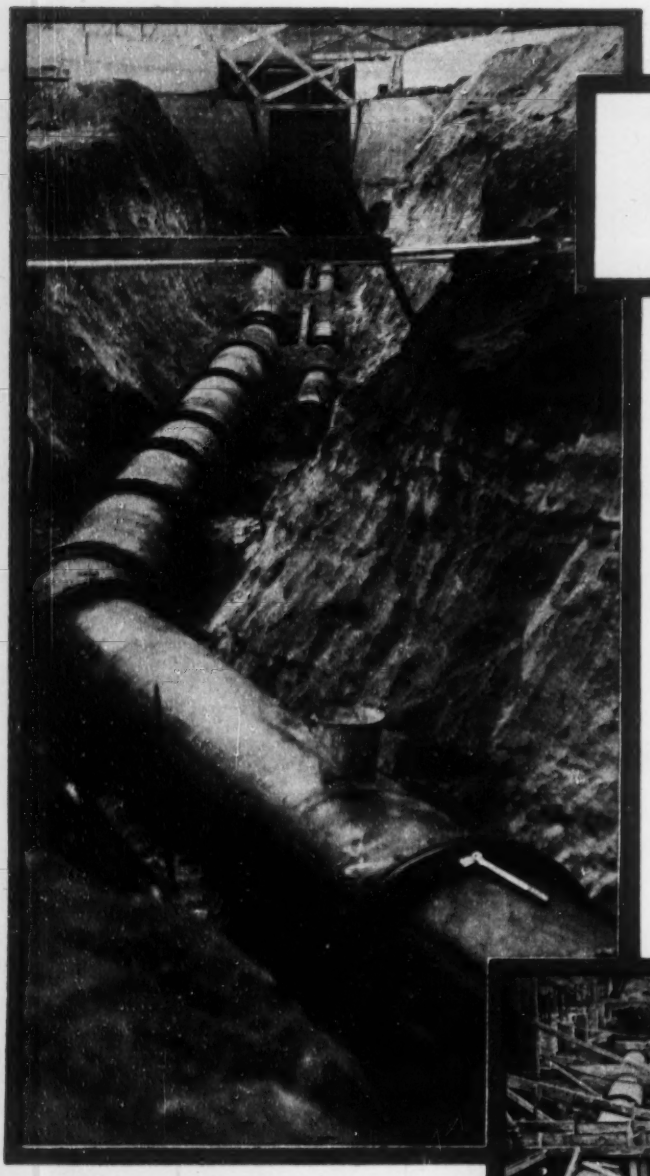
Residential subdivisions have been built on arroyo streambeds with no provision being made for protection. Runoff has been speeded considerably by the tremendous growth of eastern Albuquerque, where scores of miles of new paving became torrents even in a moderate rainfall; storm sewer construction has fallen behind minimum needs, and the constant silting-up of the Rio Grande has raised that stream

(*Continued on page 56*)

Wide World photo

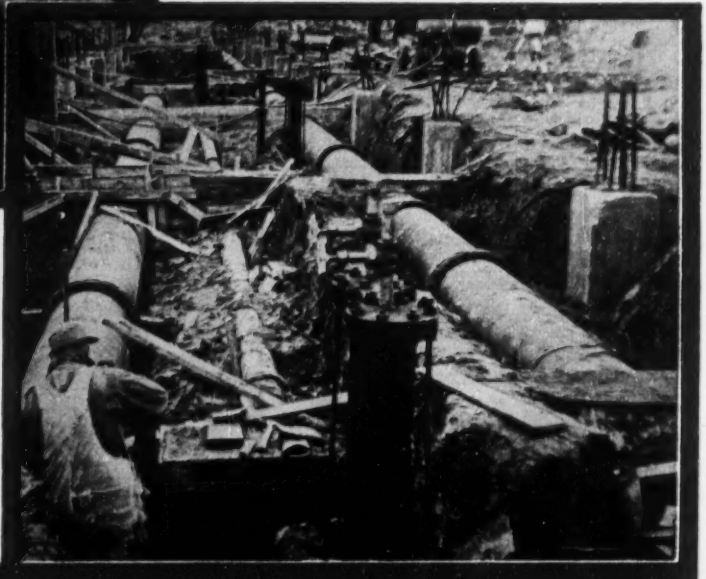
Plastic disks ruled out by New York City

An experiment in "permanent" traffic-line marking was written off recently as a failure and a test of another product was initiated in Times Square, according to T. T. Wiley (left), Traffic Commissioner of New York City. He said that the disks have been partly obliterated—more from damage by snow plows than from heavy traffic—and that he is hopeful that the city will find plastic strips, developed at Texas Agricultural and Mechanical College from a British formula, more effective. It is hoped that in the long run the strips will be less costly than painted lines.



Used on jobs

When an installation, once completed, should be as trouble-proof as planning and materials can make it—engineers rely on cast iron pipe. It has high beam-strength, compressive-strength and shock-strength. Its effective resistance to corrosion ensures long life, underground or underwater. These are reasons why cast iron pipe is so widely used for water lines in tough terrain, pressure and outfall sewers, river crossings, and encased piping in sewage treatment and water filtration plants. For further information write: Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3, Ill.

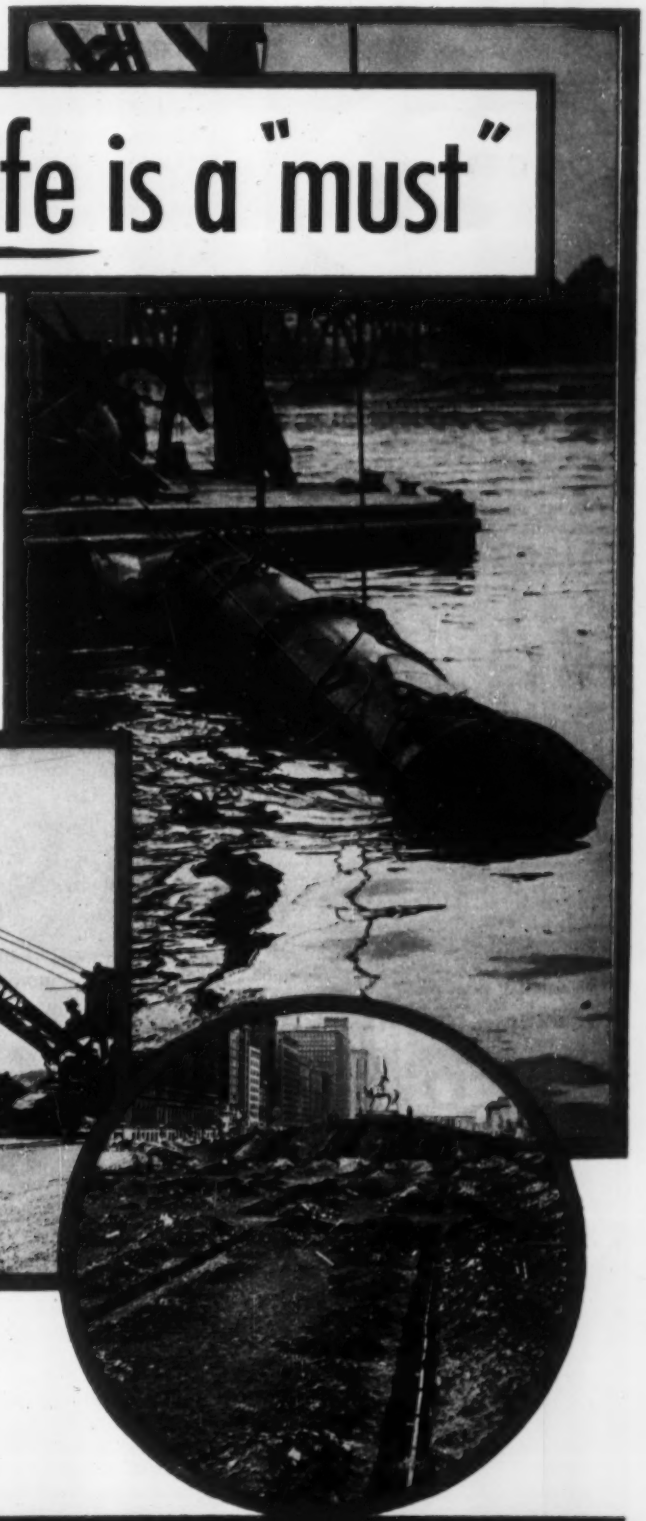


(above)
Cast iron mechanical joint pipe installed in connection with a new, larger sewage treatment plant at Rochester, Minn.

(at right)
Installing cast iron mechanical joint pipe used in air-conditioning system for Northland Shopping Center, Detroit, Mich.

CAST IRON PIPE

where long life is a "must"



(top right)
Installing large diameter cast iron pipe across Willamette River at Portland, Oregon for sewer line to interceptors and to new disposal plant.

(below)
Seven miles of 16-inch mechanical joint cast iron pipe installed for gas main in New Jersey.

(at right)
Installation of cast iron pipe for irrigation and sprinkling system for a Chicago park.

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Fir plywood formed concrete is smooth, tin-free. Requires less rubbing. Ceilings can be painted direct after a minimum of finishing—eliminating plastering.
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Interior PlyForm gives several re-uses, up to 12-15 not unusual...over twice as many re-uses with Exterior PlyForm and overlaid panels. Plan and build forms for long service.
SPECIFY BY DFPA GRADE-TRADEMARKS
These grade-trademarks identify quality panels made expressly for form work. 1. Interior PlyForm (moisture-resistant glue) for multiple re-use. 2. Exterior PlyForm (100% waterproof glue) for maximum re-use. 3. Overlaid (hardboard or hard, resin-fiber surface) exterior plywood for maximum re-use plus smoothest concrete.
PLYFORM
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DFPA GRADE-MARKED
Fir Plywood Industry Product

bed to the point where many arroyos cannot drain into it.

Sandia District's chief function in the control program is that of sponsoring agency. Its financing will come from a direct tax on all property in the district. The district's first levy—$5 per $1,000 assessed valuation—was put on bills sent out this year for 1953 property taxes and is expected to raise approximately $3 million. This money will be used for preparation of the master plan and for purchase of rights-of-way.

At a later date, the district will appraise all properties within its boundaries for benefits each will receive under the plan. Bonds then will be issued to provide funds for construction and assessments will be levied against the properties to pay off the bonds. Preliminary estimates set the cost at between $10 and $15 million.

The Corps of Engineers already has completed plans for the work that the federal government will be asked to finance, at an estimated cost of $10.3 million. These plans call for two huge ditches paralleling the Rio Grande about two miles to the east. They would be capable of carrying up to 50,000 cfs.

• **A note of doubt**—Early this spring Albert K. Nohl, of Santa Fe, N. M., Director of the New Mexico Taxpayers Assn., warned that Albuquerque's bonded debt was more than four times over the "safe" limit.

"On the basis of experience in the depression, which was a genuine test of debt-paying capacity," said Nohl, "it may be said that very few of these cities with debt ratios falling below 10% encountered any serious difficulty in meeting their obligations.

". . . A ratio of 10% seems to mark the upper limit of safety in acquiring debt."

He considered it significant that bonds that Albuquerque sold last July required an interest rate of 3.5%, while Albuqueque school bonds and bonds of other cities bore interest of only two to 2.75%.

Since 1940, he pointed out, the city's population has increased four times—its assessed valuation also has increased fourfold—but its bonded debt has increased 6.3 times and its operating budget 9.5 times.

State medical college urged as Senate studies financing

The Republican majority of the New Jersey State Senate is planning to refer to voters at a November election the question of issuing bonds to finance a state medical-dental college.

The Senate majority has delegated a committee to explore sources of revenue that might be used to support such a bond issue. Majority leader, Bruce A. Wallace, said it was agreed that grants from philanthropic funds would not be forthcoming until the state took definite action.

Estimates for construction of buildings for such an institution are placed at about $25 million, with annual maintenance placed at $5 million more.

A state commission has suggested New Brunswick, in the central portion of the state—and now home of the New Jersey State College for Women, and Rutgers University—as the ideal location.

Municipal briefs . . .

• **New all-purpose terminal** — The Commerce Committee of the House of Representatives has approved a bill to turn over Hog Island to the city of Philadelphia for development as an air, rail and marine terminal. The committee acted shortly after federal and city witnesses had urged approval of the proposal.

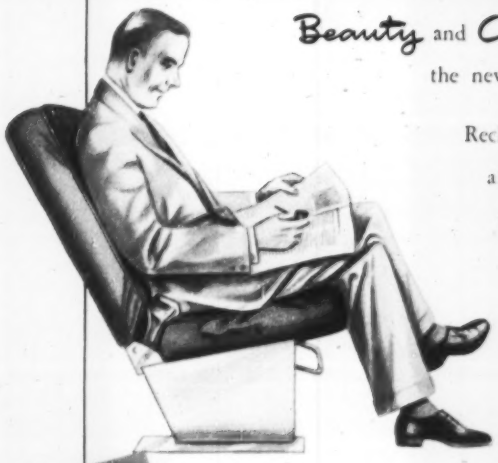
• **30 to 1**—Freeholders in Volusia County, Florida, turned in an overwhelming vote of 12,533 to 468 in favor of an $8-million bond issue for the widening of U. S. Highway No. 1 to four lanes through their county. Total cost of the widening projects will be an estimated $34 million.

• **Fight disposal plant**—Three North Miami Beach taxpayers have filed suit to restrain the city council from completing the purchase of an eight-acre site for a sewage disposal plant. The site is near an area that has been built up with homes in recent months. The complainants are residents of the area.

• **Five-level parking for Phoenix**—Parking relief will result at Phoenix, Ariz., from a $500,000 five-level parking garage to be erected in the city's downtown business district. The structure will cover an area of 200 x 137 ft, and will accommodate 285 cars, according to George and Arthur Luhrs, owners.

• **On-the-roof parking**—Southern National Bank of Spartanburg, S. C., has announced the inclusion of a roof parking area on its new building planned in that city. Construction of the $250,000 building is scheduled for next spring.

beauty and comfort in the new . . . AERO Commander 560



Beauty and **Comfort** typify the many advantages in the new Aero Commander 560.

Reclining individual chairs, adjustable fore and aft, bring arm chair comfort to the flying executive.

This custom interior is an actual photograph of the spacious cabin area of this 5-7 place, twin-engine executive airplane.

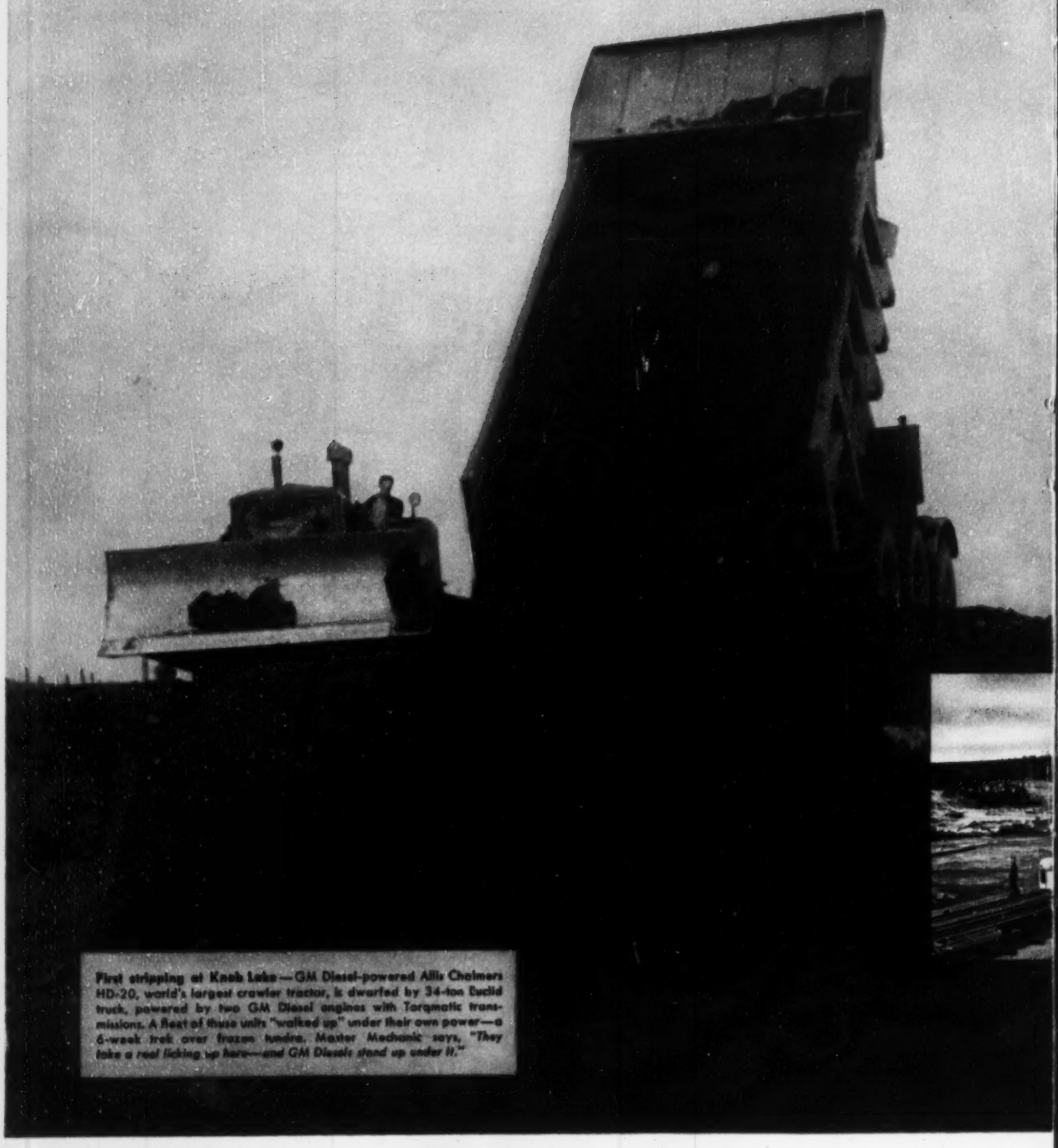
WRITE
DEPT. 200
FOR NEW
CATALOGUE

AERO DESIGN Commander 560

AERO DESIGN AND ENGINEERING COMPANY • TULAKES AIRPORT • P. O. BOX 118 • BETHANY, OKLAHOMA

How GM DIESEL POWER helps tap one of

WORLD'S RICHEST



First stripping at Knob Lake—GM Diesel-powered Allis Chalmers HD-20, world's largest crawler tractor, is dwarfed by 34-ton Euclid truck, powered by two GM Diesel engines with Torqmatic transmissions. A fleet of these units "walked up" under their own power—a 6-week trek over frozen tundra. Master Mechanic says, *"They take a real licking up here—and GM Diesels stand up under it."*

IRON ORE DEPOSITS

Punching a railroad 360 miles through mountains and muskeg to the rich new ore fields of Ungava, on the remote Quebec-Labrador border is the job of the Iron Ore Company of Canada, and contractors*. To build the road, tunnels, dams and terminal facilities they are using more than 200 General Motors Diesels for more different kinds of work than any other engine. The smooth power-packed GM 2-cycle engine is the world's most widely used Diesel because *it sticks dependably to any job and gets work done faster at lower cost.* Let this great GM Diesel engine prove its superior performance and economy on *your* job—just as it's doing on the world's biggest, toughest projects.

*CMMMK—Cartier—McNamara—Mannix—Morrison-Knudsen

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Laying rail near Mile 200 with Burro crane—one of the many General Motors Diesel-powered cranes and shovels used by I.O.C. GM Series 51, 71 and 110 engines feature same rugged 2-cycle design as GM locomotive engines — *more power in less space!*

Crushing rock for Menihek Dam, 30,000 KW project at Mile 330, GM 6-71 Diesel drives Holland hammer mill producing up to 500 tons per day. Auxiliaries powered by GM Diesel-driven generator. Used earlier for lighting base camp, this unit had accumulated 18,000 hours without repairs.

No-turn shuttling, rapid acceleration and quick unloading of GM Diesel-powered Koehring Dumptors add up to fast haul cycles in tight quarters. At Mile 11, a 2500-ft. tunnel was dug. In gorge between Miles 12 and 15, more than 400,000 cubic yards of rock were hauled by these flexible units.

Cutting lumber for townsite at Knob Lake, one of I.O.C.'s GM Diesel-powered sawmills turns out 12,000 board feet per day. "Never stalls on spruce knots." GM Diesel-powered tractors build and maintain logging roads. *Interchangeability of GM Diesel parts insures higher availability, cuts costs.*

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contractors solve their toughest pumping problems. Small, compact, gasoline-engine-driven Homelites are quickly set up anyplace . . . and pump up to 15,000 gallons per hour, with a 28 foot suction lift, and with no manual attention. Send for Homelite pump bulletin.

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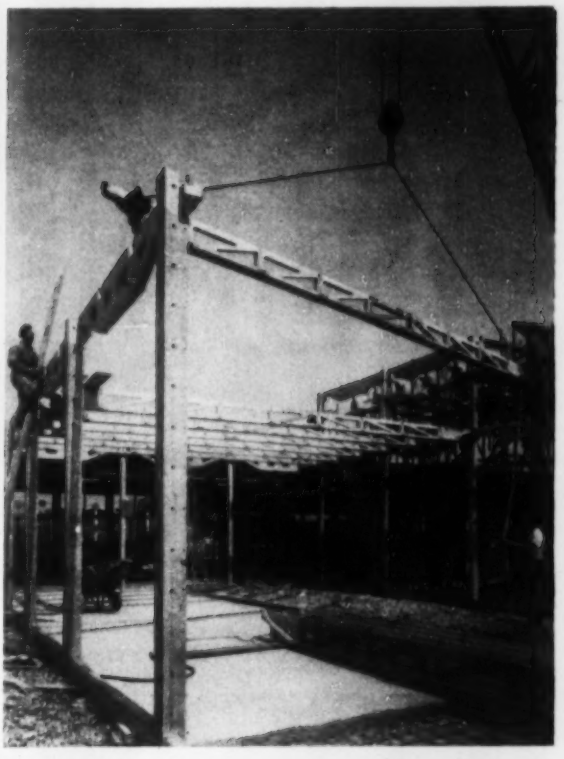
1107 Riverdale Ave., Port Chester, N.Y.

ROOF BEAM GRILLAGE (above)—short precast lattice-type beam units, assembled, grouted, post-tensioned on site.



TRANSVERSE BEAMS (right) are post-tensioned before erection. Longitudinal beam units are placed between transverse beams and post-tensioned, making grillage a monolithic unit.

Flexibility for a precast modular, prestressed school

Designed for a maximum spans of 40 ft and a height of four stories, a system of modular concrete units, precast and prestressed, has been developed for fast and flexible school construction in England.

A prototype structure, the Worthington Secondary Technical School, is now nearing completion and incorporates all elements of the prefabricated system, known as "Intergrid." Based on a 3-ft. 4-in. horizontal module and a 10-in. vertical module, the design lends considerable flexibility in the use of standard components.

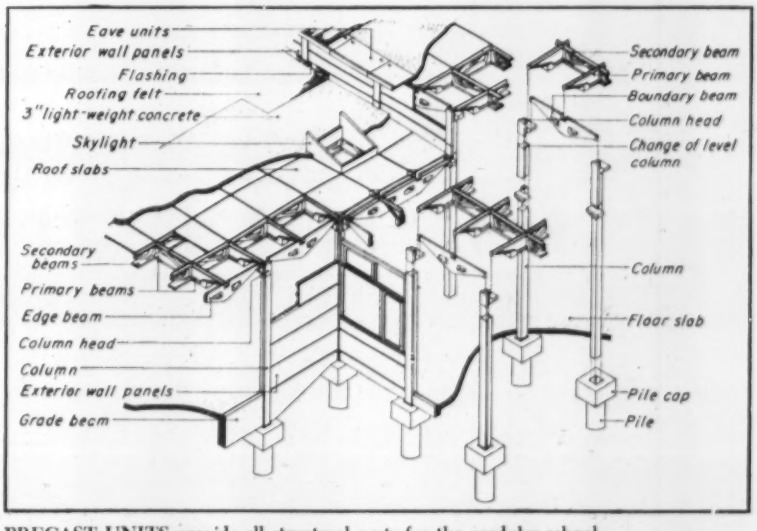
• **Post-tensioned grillage** – Floor and roof systems consist of a grillage of post-tensioned beams at 3-ft 4-in. centers in both directions and supported by edge beams and column heads around the periphery of each structural bay. Over the interstices formed by the transverse and longitudinal beams are placed square and slightly domed concrete slabs, unreinforced and 2¼ in. thick at the edge, 1¼ in. thick at the center. The post-tensioned grillage and the grouted-in floor slabs act as a monolithic unit.

Maximum spans for the bays are 23 ft 4 in. x infinity, 26 ft 8 in. x 40 ft, 33 ft 4 in. x 33 ft 4 in. for floors, and 36 ft 8 in. x infinity and 40 ft x 40 ft for roofs.

Primary beams (usually traverse) are placed at 3-ft 4 in. centers and consist of two solid precast end units and a varying number of identical precast lattice units, 3 ft 4 in. long and 12¾ in. deep. Assembled on the site and grouted, these units are post-tensioned and erected, spanning the short width of the bay. The units are post-tensioned with either four or eight 0.2-in. dia wires lying in grooves on the lower flange of the beams. The Freysinnet system is used in prestressing.

An open truss system is used for

(Continued on page 65)



PRECAST UNITS provide all structural parts for the modular school.

ANOTHER NEW TUNNEL RECORD

by

GARDNER-DENVER

New record for big-bore, timber-supported tunnel: 314 feet in six days.

CONTRACTOR: Walsh Construction Company

PROJECT: Pacific Gas and Electric Company Tunnel at Big Bend, California

TUNNEL LENGTH: 21,500 feet

SIZE & SECTION: 23-foot horseshoe

ROCK: Lava

ALTITUDE: 2,500 feet

GARDNER-DENVER

GARDNER-DENVER No. 1 CHOICE AT P.G.&E. PIT No. 4

- **5 WBJIM**
  Stationary Compressors
- **2 WBK-500D**
  Portable Compressors
- **1 WBH-365D**
  Portable Compressor
- **25 SF93P**
  Drifters on 48" Change
  Aluminum Guide Shells
- **18 JA & JB**
  Hydraulic Booms
- **1** Hydraulic Boom with Power Swing and Power Dump and Swing for Drill
- **2 JCM**
  Hydraulic Pump Units
- **5 VP4**
  Sump Pumps
- **10 S55D**
  Sinkers
- **3 S73D**
  Sinkers
- **2 R91SC**
  Stopers
- **1 S48P**
  Air Feed Leg Drill
- **2 28E**
  Clay Spaders
- **1 EF-BC**
  10 x 5 x 10 Grout Pump
- **1 EF-FSA**
  10 x 4½ x 10 Grout Pump
- **1 FD-FS**
  10 x 3 x 10 Grout Pump

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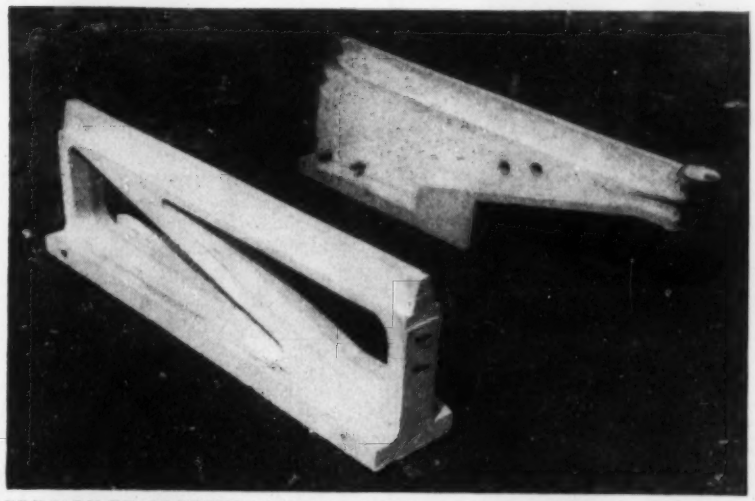
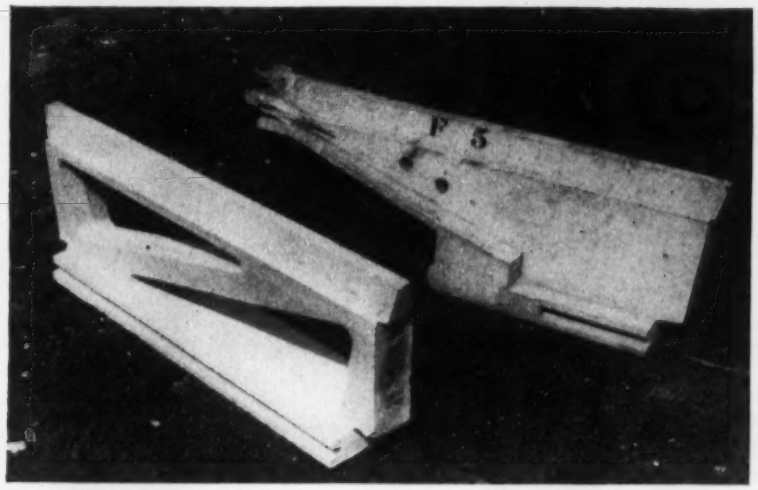


PRIMARY BEAM UNITS take prestressing wires on bottom flange.



SECONDARY BEAM UNITS have ends designed for seat on primary beams.

the precast beam sections to accommodate heating, plumbing and electrical lines above a hung ceiling which is fastened to the lower flange of the beams.

Secondary beams (usually longitudinal) are composed of units like those used in the primary beams, but with a projecting lip at the top of the flange which rests on the top flange of the primary beams. These secondary beam units are placed after erection of the primary beams and post-tensioned in place, the prestressing wires running through a groove in the lower flange and through a hole provided for the purpose in the bottom flange of the primary beams.

Edge beams around the perimeter of each structural bay are of reinforced concrete cast in standard

(*Continued on page 69*)

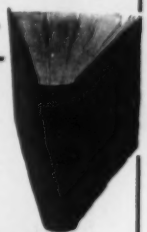
PRECAST PANELS fit in column groove.

HANDBOOK OF HYDRAULICS

4th Ed.—Just Published

Here in compact, accessible form are the many tables and other reference data required by the practicing hydraulics engineer who wants to speed his computations without sacrificing accuracy. Covers every phase of common practice as well as many special problems. Condenses and simplifies rules and formulas. Fourth Edition includes information on fluids other than water, modern material on orifices and sluice gates, weirs, pipes, uniform and nonuniform flow in open channels, etc.

By H. W. King. Revised by E. F. Brater, Prof. of Hydraulic Engineering, Univ. of Michigan. 4th Ed.
567 pp., 165 illus., 133 tables, $8.00



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By R. L. Peurifoy, Professor of Civil Engineering, A&M College of Texas. 350 pp., 60 illus., $7.50

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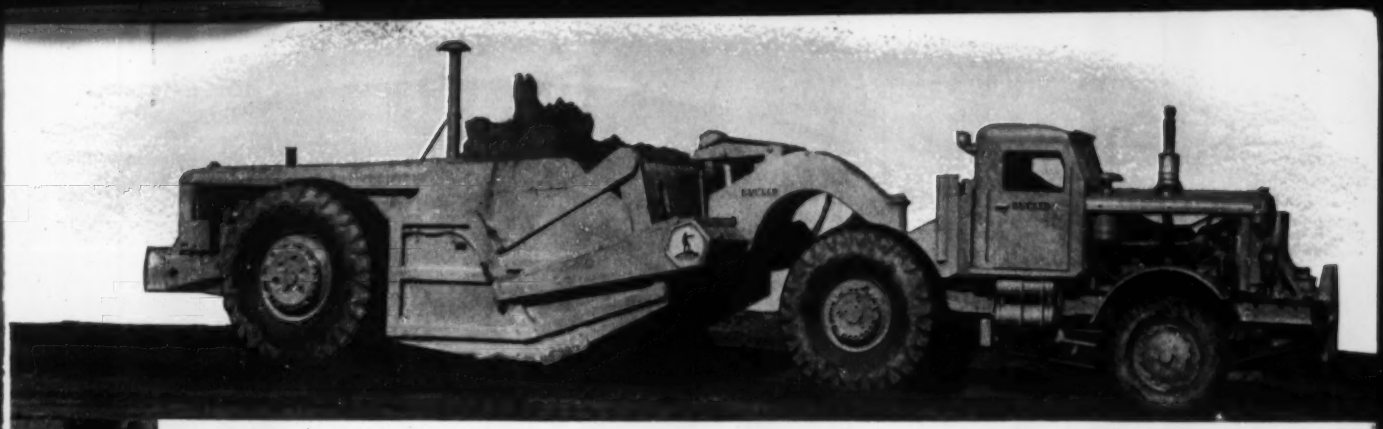

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Euclid scrapers—78 of them—are maintaining a fast pace for 14 of the contractors on the Ohio Turnpike. Big Twin-Power "Eucs" of 18 cu. yd. struck capacity and 15.5 cu. yd. scrapers are making dirt fly all along the way. Fast travel speed, ability to get heaped loads in practically any material, and unsurpassed job availability make Euclid scrapers the logical choice of rubber-tired earth moving equipment for these grading contracts.

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lengths of 6 ft 8 in. and 10 ft long. They are supported on column heads and in turn support one or two primary beam ends.

Columns are placed at either 6-ft 8-in. centers or 10-ft centers around the periphery of each bay. Having a section 6½ x 4½ in. with recessed sides, the columns are pretensioned with four 0.2 in. dia wires. Ground level columns are erected in sockets cast in the foundations, and those on the upper floors rest on column heads of the lower column and are pin-jointed.

• **Slots for wall panels**—All outside columns have a projecting edge on the outer side and are cast with holes through them at 10-in. vertical centers for securing precast concrete wall panels. These wall panels are placed from the inside of the building, and are finished on the outside with exposed aggregate. The whole of the external wall is formed when an interior panel, precast with a honeycomb finish is placed leaving an air space between inside and outside panels.

The precast system as used in the Worthington School does not allow spans and loadings required for a large gymnasium, and therefore the 50-ft long gymnasium spans are of a slightly different design, the units being stressed together with a Freyssinnet 12-wire cable. For future jobs the ordinary roof beam units as used elsewhere throughout the building will be adapted for the 50-ft spans.

Ceiling construction consists of asbestos board strips suspended from the undersides of beams by adjustable clips, a system providing squares into which panels forming a hung ceiling can be fixed.

Precast plaster panels have been used for most of the partitions in the school. Staircase wells were cast in place, but a precasting system has now been satisfactorily developed for use with subsequent construction.

The school was designed for the West Sussex and Worthington Education Committees by the architects and building branch of the Ministry of Education, in association with the county architect's department, West Sussex County Council. Engineer for the prestressing operations is the Pre-Stressed Concrete Co., Ltd., and the contractor is Gilbert-Ash, Ltd. With the exception of the prestressed columns and staircase stringers—cast and stressed by the Liverpool Artificial Stonoe Co., Ltd.,—all the precast units were manufactured by Mono Concrete, Ltd.

U. S. firm hired to plan Puerto Rico central market

The Puerto Rico Transportation Authority has hired Knappen-Tippetts-Abbett-McCarthy, New York, to prepare plans and specifications for the first phase of the $22-million central market and port improvement project to take place in San Juan's metropolitan area.

The site—a mangrove swamp—will have to be reclaimed through drainage, filling and preparation before construction is undertaken on market buildings, a grain elevator, feed mill and slaughtering house.

The first phase of the project (cost: $60,000) will include filling and consolidation of about 480 sq yds of land; diversion of the Puerto Neuvo River; drainage of adjacent areas; installation of a sewer system and facilities for water supply, electricity and communications; construction of streets.

The port development part of the project will include construction of wharf facilities to provide berths for 15 vessels, transit sheds with 220,000 sq ft of space, and large cargo warehouses. This phase of the project is expected to get under way in the spring of 1956. A channel in from one of the two initial ship berths will be dredged the following year and additional transit sheds, slaughtering houses, grain elevators and feed mills will be built.

Colombian airport projects get summer starting dates

Construction of five international airports will get under way in Colombia within the next three months. All of them are designed to handle the heaviest aircraft in use at present and the total cost will run about $21.2 million.

Here's how the plans shape up:

Bogota: Two parallel runways, each 11,800 ft long. Cost: $12-$16 million.

Cali: One runway, 9,500 ft long. Cost: $6 million.

Barrancabermeja: One runway, 6,100 ft long. Cost: $2 million.

San Andres Island: One runway, 5,900 ft long. Cost: $600,000. This airport will be of special importance to the Caribbean Sea islands around San Andres because up to now their only connection with Colombia has been by small boats.

Leticia: One runway 5,900 ft long. Cost: $600,000. This airport site, located on the upper Amazon River, will shorten substantially the New York flights to Rio de Janeiro, Buenos Aires and Santiago.

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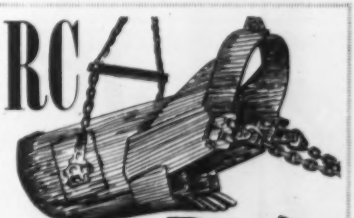
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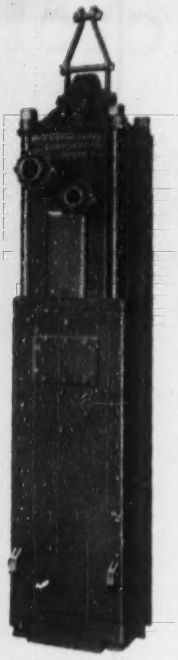

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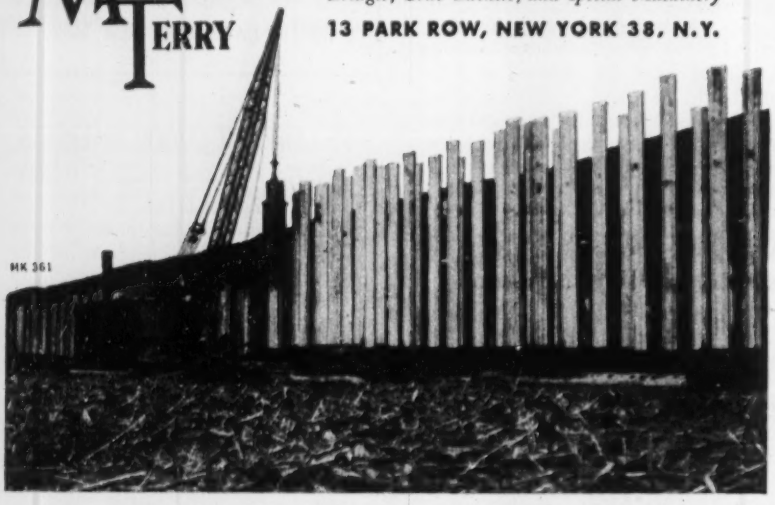

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OBITUARIES

Henry L. Marchand, 54, San Francisco consulting engineer specializing in structural design, died June 19. A graduate of Ecole Centrale, Paris, he was a member of a 10-man committee that received the 1953 Leon S. Moisseiff award for a paper on lateral forces of earthquake and wind. Before opening his own office in 1946, he was chief designing engineer for L. H. Nishkian, San Francisco consulting engineer.

A. M. Young, 70, senior member of the firm of Young, Richardson, Carleton & Detlie, architects and engineers, died June 20 in Seattle. A graduate of the University of Michigan, he went to Seattle in 1910 to organize the structural steel division of the Moran Co.

Ferdinand J. Brimeyer, 54, member of the Milwaukee architectural firm of Brimeyer, Grellinger & Rose, died July 3. A graduate of the University of Minnesota, he held degrees both in architecture and engineering.

Robert M. Watkins, 52, contractor and chairman of the Maryland-National Capital Park and Planning Commission, died July 3 in Washington, D. C. Most of his career as a builder was spent in the construction of houses in the College Park, Md., area.

George E. Martin, 67, retired consulting engineer for the paving material department of the Barrett division of the Allied Chemical & Dye Corp., New York, died July 5 in New Rochelle, N. Y. He was graduated from Purdue University, where he later became an instructor in engineering and head of the department of highway engineering. He served with the Barrett Division from 1920 until last year.

John A. Stalfort, 66, president of the Consolidated Engineering Co., Baltimore, died July 13. He directed construction of some of the largest buildings in Baltimore and Washington, D. C., including the Department of Commerce building, the House office building, the Library of Congress annex and units of Johns Hopkins University. A 1910 graduate of Cornell University, he became chief engineer of Consolidated in 1911 and president in 1938.

J. Alston Fisher, 54, assistant secretary of the William P. Lipscomb Construction Co., Washington, D. C., died

July 7. He received his degree from the University of Michigan in 1923 and during his career as a civil engineer worked in the capital for Southern Railway, George A. Fuller Co. and James A. Baird Co.

Dee M. Hipp, 47, civil engineer with the Baltimore District, Army Corps of Engineers, died July 2. At the time of his death he was preparing a design memorandum on the next unit of the Swoyersville-Forty Fort, Pa., flood cointrol project, now under construction. Following graduation from Oklahoma A. and M. College in 1931, he worked in the construction department of the Oklahoma State Highway Commission. His Corps career began in 1936 with the Vicksburg District. In 1937 he was transferred to the Rock Island District and in 1939 to Baltimore.

Roger G. Gandy, 52, Alexandria, Va., building contractor, died July 6. After serving 18 years as an engineer with the North Carolina Highway Commission, he founded the Gandy Trucking Co. and operated the Gandy Motor Co. in Albermarel, N. C. He was appointed testing engineer at Fort Belvoir, Va., in 1942 and entered the contracting business following the war.

W. O. Washington, 70, Cameron County, Texas, engineer for 19 years, died July 4 in Brownsville, Texas. He received his civil engineering degree from the University of Texas in 1904. His 50-year career included service as engineer for several Texas counties; engineering consultant to the International Boundary Commission; Brownsville city engineer; supervising engineer for the Defense Plant Corp. on construction of synthetic rubber plants in Corpus Christi and Ingleside, Texas. From 1945 to 1950 he was a partner in the Brownsville engineering firm of Washington and Ruff.

Williams A. Sims, an engineer-inspector for the Virginia State Department of Highways, died July 9 in Richmond. He began his career with the road department 24 years ago as a maintenance employee. Later he became foreman and construction superintendent in the Richmond and Lynchburg districts.

James S. Lotimer, former consulting engineer for the Ontario Hydro Power Commission in Toronto, died July 7. He served with the commission for 44 years before retiring last December.

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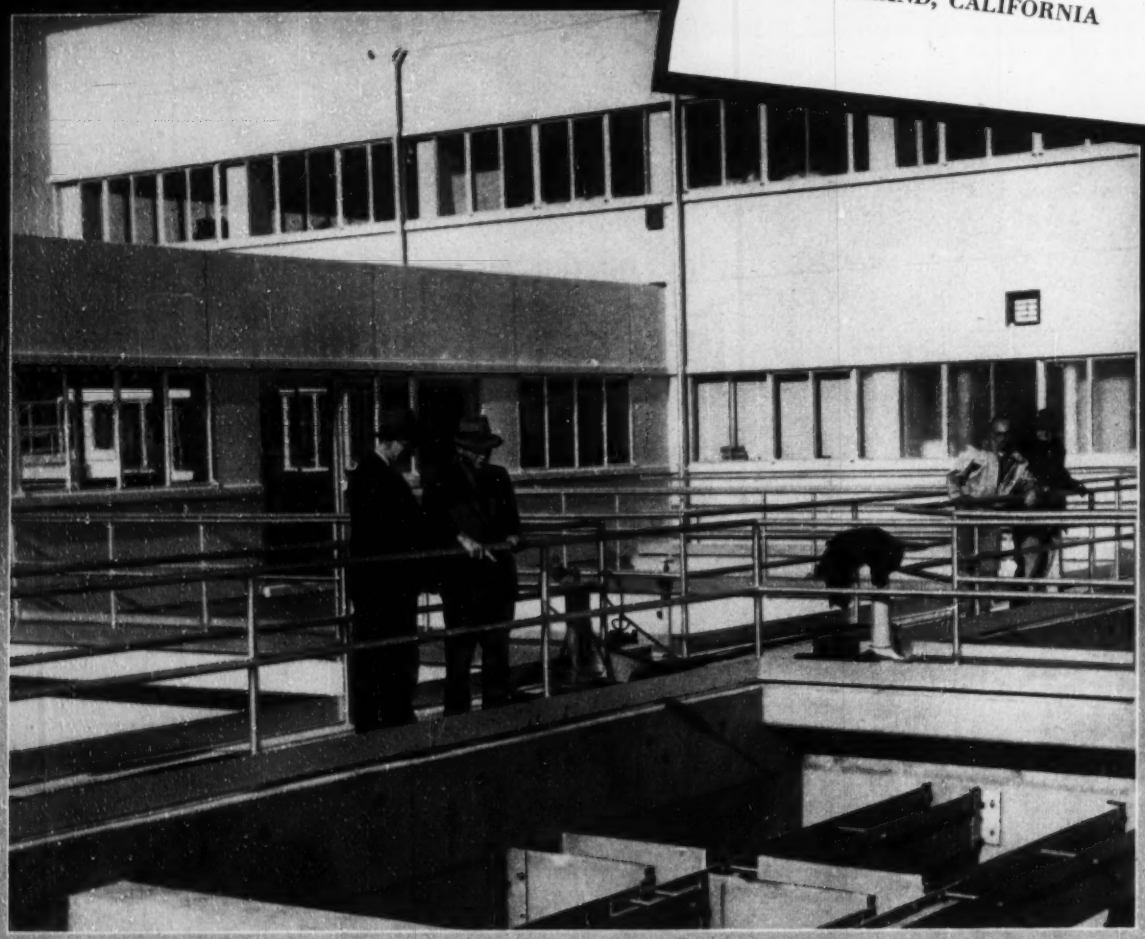
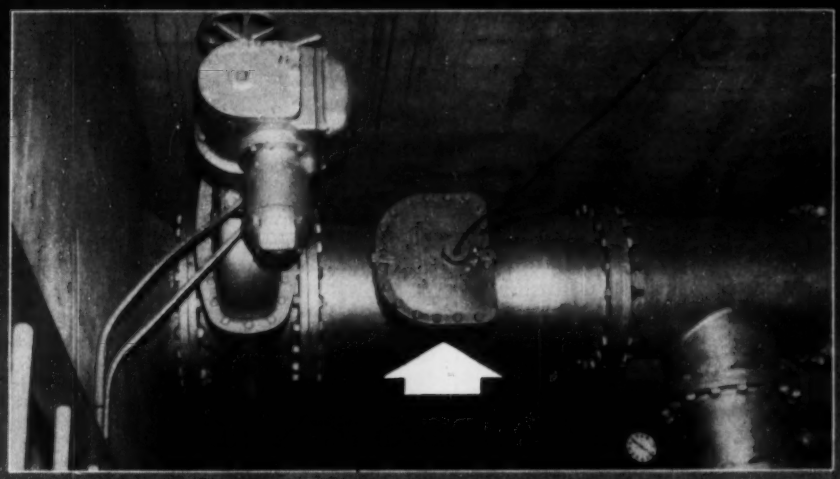


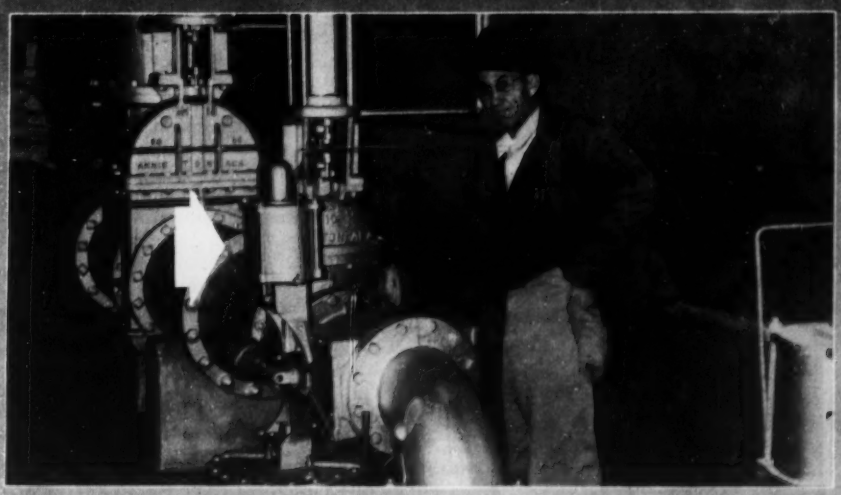
A major element of Vallejo's new six million dollar water supply system is this 14 MGD Water Treatment Plant, built to meet the needs of this expanding industrial city. The facilities include two hydraulic-jump flash mixers, two slow mixing channels, six flocculation tanks, six sedimentation basins, and twelve rapid sand filters. An interesting feature of the plant is its reclamation basin which reclaims wash water for subsequent recirculation through the treatment process. Sludge is lagooned and dried for park use.

Mr. T. D. Kilkenny, Vallejo City Engineer, and Mr. H. L. Thackwell, Consulting Sanitary Engineer for Kaiser Engineers, cooperated in the design and engineering of this attractive plant. Its modern controlling and metering equipment, installed by Walsh Construction Co. and Hastorf-Nettles, Inc., includes: Builders Master Rate Control (a simple, pneumatic system), super-accurate Omega Chemical Feeders and Slakers (arranged for automatic-proportional Chronoflo control); also Builders Venturi Tubes, and Builders Chronoflo Telemeters and Summators. For further details on Builders Meters and Controls and Omega Feeders installed at the Fleming Hill Water Treatment Plant, address Builders-Providence, Inc., Providence, Rhode Island.

Messrs. Kilkenny and Thackwell at one of the six filter operating tables which employ Builders Loss-of-Head and Rate-of-Flow Gauges and Filter Operating Equipment. Each table serves two filters.



Looking down on 24" Builders Propeloflo Meter showing cable which drives remote Totalizer-Indicator-Recorder. This Meter is of particular interest because it meters the flow both in and out of the Vallejo-Swanzy Reservoir.



Maintenance Supt. "Pop" Alley standing beside one of the Builders 10" Model RCE Filter Rate Controllers. Arrow points to power cylinder which positions the Controller in response to the Pneumatic Master Rate Control.

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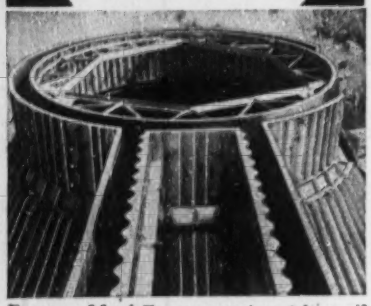

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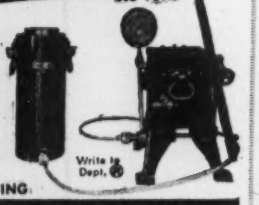

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BOOKS

Perlite-concrete design

LIGHTWEIGHT INSULATING FIREPROOF CONCRETE ROOF DECK SPECIFICATION MANUAL—By Dale A. Lehr. 218 pp. Perlite Division, Great Lakes Carbon Corp., 612 So. Flower St., Los Angeles 17, Calif. Limited free distribution.

Building designers will find very useful this new manual on perlite concrete for roof decks, in which, for the first time is taken an authoritative and sound engineering approach to a subject of growing importance. The book contains numerous tables and diagrams of roof construction that simplify design. A looseleaf binder enables supplementary information to be added later, when available.

Perlite aggregate, formed by "popping" a siliceous volcanic rock at 1,500 F, weighs less than one-tenth as much as sand or gravel. It can be used alone as a non-structural insulation fill or mixed with portland cement and water to form a lightweight structural concrete of high insulative value. The book presents data for both types of application.

Design tables in the manual enable a designer to pick out the thickness of roof deck required for various mixes to obtain a desired overall insulation value. The compressive strength of the slab also is given, thus enabling the designer to check the thickness for load-carrying capacity.

The tables give coefficients of heat transfer (U-values) for slabs on permanent forms of various types, on metal lath and on paper-backed wire mesh. The effect of ceilings is taken into account. Accompanying drawings show details of the various types of construction.

Also included in the manual are typical specifications and recommendations for mixing, handling and testing perlite concrete, technical data for subpurlins and a discussion of commonly encountered problems, with suggestions for avoiding or correcting them.

Miscellaneous notes

• **Pullout tests on nails** are summarized in a 7-page bulletin of the Virginia Polytechnic Institute, Wood Research Laboratory, Blacksburg, Va., titled "Fastening of Gypsum Wallboard with Theaded Nails." As reported by Prof. E. George Stern, cement-coated plain-shank nails proved to be about as satisfactory as threaded-shank nails immediately after driving, but not as good after a lapse of time. Taper Stronghold Screwnails, manufactured by the Independent Nail & Packing Co., Bridgewater, Mass., offered optimum holding power among threaded nails tested.

New engineering books

PRINCIPLES OF EXPERIMENTAL STRESS ANALYSIS—By Mark B. Moore. 146 pp. Prentice-Hall, 70 Fifth Ave., New York 11, N. Y. $4.00

GRAPHICS IN ENGINEERING AND SCIENCE—By A. S. Levens. 696 pp. John Wiley and Sons, 440 Fouth Ave., New York 16, N. Y. $7.00

PRINCIPLES OF GEOMORPHOLOGY—By William D. Thornbury. 618 pp. John Wiley and Sons, 440 Fourth Ave., New York 16, N. Y. $8.00

INTRODUCTORY CALCULUS WITH ANALYTIC GEOMETRY—Edward G. Begle. 304 pp. Henry Holt & Co., 383 Madison Ave., New York 17, N. Y. $4.50

CALCULUS, AN INTRODUCTION TO ANALYSIS, AND A TOOL FOR THE SCIENCES—By Gaylord M. Merriman. 625 pp. Henry Holt & Co., 383 Madison Ave., New York 17, N. Y. $6.50

METALS AND HOW TO WELD THEM—By T. B. Jefferson and Gorham Woods. 322 pp. The James F. Lincoln, Arc Welding Foundation, Cleveland 17, Ohio. $2.00

HEAT CONDUCTION WITH ENGINEERING, GEOLOGICAL AND OTHER APPLICATIONS—By Leonard R. Ingersoll, Alfred C. Ingersoll and Otto J. Zobel. 325 pp. University of Wisconsin Press, 811 State St., Madison, Wis. $5.00

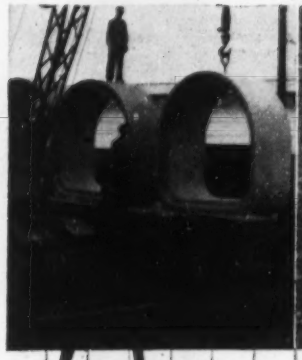
THE COMMUNITY BUILDERS HANDBOOK—Prepared by the Community Builders Council of the Urban Land Institute. 314 pp. Urban Land Institute, 1737 K St., N. W., Washington 6, D. C $12.00

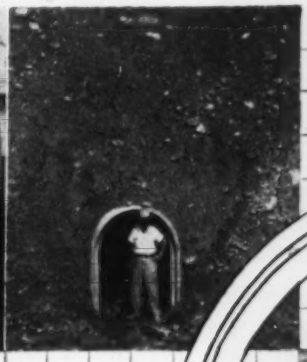
IRRIGATION DEVELOPMENT AND PUBLIC WATER POLICY—By Roy E. Huffman. 336 pp. The Ronald Press Co., 15 East 26th St., New York 10, N. Y. $6.50

ELEMENTS OF STRUCTURAL ENGINEERING—By Ernest C. Harris. 505 pp. The Ronald Press Co., 15 East 26th St., New York 10, N. Y. $7.00

COMPARATIVE BRIDGE DESIGNS—Editor: James G. Clark. 211 pp. The James F. Lincoln Arc Welding Foundation, Cleveland 17, Ohio. $2.00

MANUAL OF PRECAST CONCRETE CONSTRUCTION—Third Edition. By F. Thomas Collins. 102 pp. F. Thomas Collins & Associates, 921 West Las Tunas Drive, San Gabriel, Calif. $25.00





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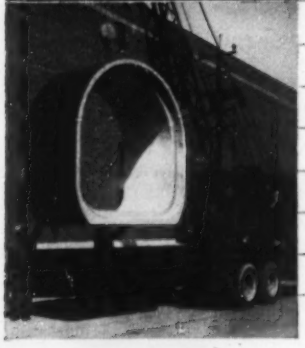

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MEN AND JOBS

Partner runs firm as Strobel runs PES

The prosperous consulting engineering business of the New York firm of Strobel & Salzman will be directed by Joseph Salzman, an announcement reported last week.

Mr. Salzman will be sitting in for his partner Peter A. Strobel—who has become in effect the biggest landlord in the world as Commissioner of the Public Buildings Service. Mr. Strobel succeeded W. E. Reynolds, who retired June 30.

• **Big job**—Danish born, and a civil engineering graduate of the Royal Technical University at Copenhagen, Mr. Strobel for the past 25 years has been engaged in major military and civilian engineering projects throughout the United States.

In his new $14,800-a-year job, he'll need all the resourcefulness and technical skill he brings with him: He becomes responsible for the design, maintenance and operation of all federally owned or leased buildings—at present, that means 185,000,000 square feet of space. PBS spends the major part of the $100-million appropriation for the General Services Administration, of which it is a part.

• **Lease-purchase**—And one of the biggest jobs for the New York engineer will be work involving the new lease-purchase law (ENR July 15, p. 25) which permits the government to get federal buildings under construction without having to wait for appropriations covering the full cost.

Since all the buildings will be built by private capital, it will be Strobel's job to hunt out that money; deal with financing organizations; select architects, have a hand in selecting the contractors.

And just to indicate Strobel's approach to his job: He's just taken over, but he spent three months in Washington studying up on his duties, prior to his official appointment.

• **Reynolds a big influence**—The retiring commissioner, W. E. Reynolds, has had a considerable influence on government building design—and indirectly on much private construction—in 21 years as a government official.

A civil engineering graduate of Iowa State College, Mr. Reynolds started as a draftsman for the firm that became the present-day Howard, Needles, Tammen & Bergendoff, and was chief engineer of that organization when he left, 13 years later. He left to join a Florida contracting firm, and first entered government work in 1932 with the Reconstruction Finance Corporation. He became commissioner of the former Public Buildings Administration (later PBS) in 1939.

PETER A. STROBEL, Commissioner of Public Buildings Service, succeeds . . .

W. E. REYNOLDS, who has retired.

Florida roads engineer joins consulting firm

Sam P. Turnbull, recently chief engineer for the Florida State Roads Department, has become project manager at College Park, Md., for Michael Baker Jr., Inc., consulting engineers.

Mr. Turnbull left the Florida Department after 28 years of service during which he rose from a field position to the top engineering post. A veteran of World War II, during which he served three years with the

Corps of Engineers, he is a past president of the Florida Society of Professional Engineers.

Already associated with the Baker organization are two other top highway men: R. A. Haber, former chief engineer of the Delaware highway department; and W. D. Meyers, who was assistant chief engineer of the Pennsylvania department.

Men and Jobs briefs . . .

• **Careers—Charles R. Riley** becomes chief engineer, maintenance, for the B. & O. Railway, moving up from engineer, maintenance of way, eastern region . . . **Reece H. Wegenroth** joins King and Gavaris, New York consultants, as chief bridge engineer. . . .

Paul Richard becomes chief water development engineer for the Wyoming Natural Resources Board; **John D'Amico,** director since 1951, has resigned to join a new engineering firm —Wesco Engineering, at Newcastle, Wyo. . . . **E. Per Sorenson** is named manager of the Tokyo office of Tippetts-Abbett-McCarthy. . . .

Howard W. Barlow, formerly dean of engineering at Texas A & M, becomes director of the Washington State Institute of Technology at Pullman, Wash. . . . **Earl C. Goetsch,** to head of street and highway planning division of Corpus Christi.

• **Army shifts—Col. Harry O. Fischer,** named district engineer at Fort Worth . . . **Col. Loren W. Olmstead** is new district engineer at Buffalo . . . **Col. Edward E. Murphy,** to head of the Milwaukee district . . . **Col. A. J. Goodpaster Jr.,** succeeds **Col. G. H. Walker** as San Francisco district engineer.

• **Honors—Luis Giannattasio,** Montevideo, Uruguay, civil engineer, is one of four men elected to honorary membership in the American Society of Mechanical Engineers . . . **Max W. Moody,** of Walker-Moody Construction Co., elected president of the Engineering Association of Hawaii. . .

• **Business boosts—Otto A. Krueger,** formerly assistant manager, succeeds retiring **J. R. Allan** as manager of International Harvester's industrial engineering and construction department . . . **W. W. Jennings** has taken over as chairman of the Ohio River Valley Water Sanitation Commission . . . **Robert L. Smith** becomes head of **T. L. Smith Co.,** equipment manufacturer of Milwaukee.

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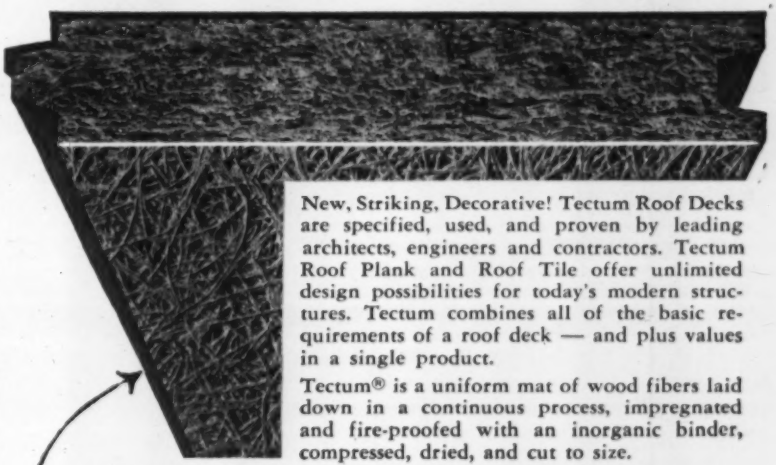

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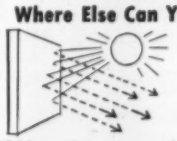

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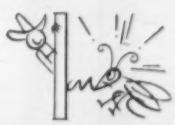

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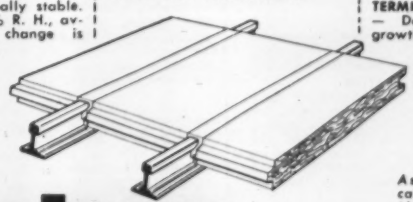

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Massachusetts**—AAA FACILITIES—BA 8/3—U. S. Eng., 857 Commonwealth Ave., Boston, Special AAA facilities 4 sites, Reading and Nahant, $1,000,000-$2,000,000. Plans deposit $50. Fay, Spofford & Thorndike, 11 Beacon St., Boston, engrs. CD 7/2.

BIDS ASKED—BUILDINGS

▲ **Me., South Paris**—TANNERY—BA 8/3—A. C. Lawrence Leather Co., div. Swift & Co., 60 Union St., Chicago, Ill., 1 story, 130,000 sq. ft. tannery. $1,150,000. Ward & Bolles, 215 Leidesdorff St., San Francisco, Calif. and Alonzo J. Harriman, 292 Court St., Auburn, archts.

▲ **Mass., Boston**—PLANT—BA 8/10—Colonial Provision Co., Inc., 128 Cross St., 2 story, 100,000 sq. ft. steel wholesale meat packing plant, Mass. Ave. and Southampton St. $1,500,000. Henschein Everds & Crombie, 58 E. Van Buren St., Chicago, Ill., archts. CD 3/11/53.

▲ **Mass., Worcester**—HOSPITAL—BA 8/12—State, Dpt. Mental Health, c/o Div. Bldg. Constr. 38 Chauncy St., Boston, M-209 Contr. 1 replacement to Summer Street Bldg., Worcester State Hospital. $8,000,000. Plans deposit $100, refundable. M. A. Dyer, 24 School St., Boston, archt. CD 12/17/52.

Mass., Avon—SCHOOL—BA 8/18—Town, H. Carroll Gilgan, supt. Schools, Town Hall, Consolidated School, W. Main St. $950,000. Plans deposit $60. Edgar T. P. Walker & Theodore B. Hanna, 131 State St., Boston, archts. (Correction—Bid date). CD 7/14.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **MAINE**—Main Turnpike Auth., 17 Bishop St., Portland,

W. H. Hinman, Inc., North Anson, Me. LB **$2,231,373.** Contr. 221A.

Lane Constr. Corp., 965 E. Main St., Meriden, Conn., LB **$4,178,388.** Contr. 221; LB **$2,564,524.** Contr. 221B, paving Augusta Exten., Scarboro, Falmouth, Auburn. Bids July 16. CD 6/25.

▲† **Jefferson Constr. Co.**, 75 First St., Cambridge, Mass. CA **$1,043,000,** est. $1,000,000-$2,000,000. communications facilities, Limestone Air Force Base, ENG-19-016-54-121, LIMESTONE, PERHAM and NORTH LYDON, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. CD 7/14, under LB.

▲ **CONNECTICUT**—State Hy. Comn., State Office Bldg., Hartford,

The Savin Constr. Corp., 10 Village St., East Hartford, Conn., LB **$2,775,583,** grading, drainage, paving, Hartford-Springfield Expressway, FA Proj. UI-139 (12), Hartford and Windsor. Bids July 12. CD 6/29.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Park Constr. Co., Inc.**, 40 Court St., Boston, Mass. LB **$1,267,000,** est. $1,200,000. Junior-Senior SCHOOL, South Franklin St., HOLBROOK, MASS. Town, R. N. Chapman, chn. Bldg. Comn., Holbrook, Mass. Bids July 15. CD 6/22.

▲ **The United Builders, Inc.**, Bellingham, Mass. Owner Builds. **$1,000,000.** 120 RESIDENCES, MARLBORO, MASS.

▲ **N. K. Winston Assoc.**, Newington, Conn. Separate Contracts. **$2,000,000.** 95 duplex HOUSES, Prince Ave., Albert, 6, 7 and 8 Sts., NEWINGTON, CONN.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

▲† **N. Y., Newburgh**—PAVING, etc.—BA On Or About 8/19—U. S. Eng., 80 Lafayette St., New York, Zone 13, airfield paving, incl. earthwork, drainage, concrete and bit. paving; jet fuel bulk storage facilities, incl. storage facilities, utilities, pump house, paving at Stewart Air Force Base, Serial No. ENG-30-075-55-17. $1,500,000-$2,000,000. Plans deposit $15. Bids June 16 rejected. CD 5/17.

BIDS ASKED—BUILDINGS

N. Y., Albany—OFFICE—BA 8/19—Henry A. Cohen, dir., Bureau Contracts & Accounts, Dpt. P. Wks., The Governor Alfred E. Smith State Office Bldg., Albany, constr., heating, sanitary, electric and elevator work for Dpt. Health, State Office Bldg., Holland Ave. Plans deposit $50 general constr., $40 heating, $20 sanitary, $30, electrical work, $10 elevators. CD 4/28/49.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Grow Constr. Co.**, 313 W. 53 St., New York, N. Y. CA **$1,862,851,** Contr. LT 160.009. 130 ft. sect. of New Jersey land tunnel of the Third Tube, incl. 80 ft. widening of an area of New Jersey plaza of Lincoln Tunnel between the tunnel and toll booths, expand tunnel emergency garage, imprv. adjacent athletic fields and playground facilities, NEW YORK-NEW JERSEY. The Port of New York Auth., 111 8th Ave., New York 11, N. Y. Bids June 29. CD 7/1, under LB.

NEW JERSEY—State Hy. Dpt., 1035 Parkway Ave., Trenton, Union Building & Constr. Co., 631 Main Ave., Passaic, N. J., LB **$898,253.** dualization of 1.123 mi. Rte. 17 (Sect. 9A) from N. Y. State Line to Ramapo River, Mahwah Twp., Bergen Co. Bids July 13. CD 6/24.

▲ **NEW JERSEY**—State Hy. Auth., State Hy. Office Bldg., 1035 Parkway Ave., Trenton,

S. J. Groves & Sons Co., U.S. Rte. 9, Woodbridge, N. J. CA **$4,074,574,** grading, drainage, paving and bridges 2.1 mi. Garden State Parkway from west of Erie R.R. to Rte. 4, Contr. No. 55, East Paterson and Paramus, Bergen Co. Bids June 24, awarded July 13. CD 6/7.

▲ **NEW JERSEY-PENNSYLVANIA**—Pennsylvania Turnpike Comn. and New Jersey Turnpike Auth., Admin. Bldg. of New Jersey Turnpike Auth., New Brunswick, N. J.

American Bridge Div., U. S. Steel Corp., 525 William Penn Pl., Pittsburgh, Pa., CA **$10,991,363,** Contr. PN4, superstructure of Delaware River Turnpike Bridge, incl. 14 girder spans, each approx. 124 ft. long; 14 deck truss spans, ranging from approx. 215 to 269 ft. main river crossing, incl. 2 end spans each 341 ft. long and central span 682 ft. long as a connection between Pennsylania and New Jersey Turnpikes. Bids July 8. CD 6/9.

MARYLAND—State Rds. Comn., 108 E. Lexington St., Baltimore, Zone 2,

M. J. Grove Lime Co. Inc., Lime Kiln, Md. LB **$662,-813.** grading, drainage, surf. 2.397 mi. Washington and Baltimore National Pike, Contr. F 492-2-720, Frederick Co.;

Bituminous Constr. Co., Inc., 3301 Ridgewood Ave., Baltimore, Md. LB **$81,388.** wid'n., relocation, surf. 3.1 mi. State Rte. 648, Contr. AA 486-1-520, Anne Arundel Co. Bids July 13. CD 6/30.

† **Piracci Constr. Co.**, 2554 Woodbrook Ave., Baltimore, Md. LB **$520,640.** special AAA facilities site W-26-C1 near Rte. 50 and Bay Bridge, near St. Margarets, Anne Arundel Co., MARYLAND. U. S. Eng., 24 St. and Maryland Ave., Baltimore, Md. Bids July 14. CD 7/7.

PROJECTS COVERED

By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000. Also Foreign projects of $100,000 and more in size of interest to American contractors.

By Regions & Classes of Construction

(In order of Listing)

BIDS ASKED
LOW BIDDERS
CONTRACTS AWARDED

New England
Middle Atlantic
South
Middle West
West of Mississippi
Far West

PROPOSED WORK

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Public Buildings
Mass Housing
Commercial Buildings
Industrial Buildings
Unclassified

In These Stages

PROPOSED WORK: Before and including appointment of engineers or architects.
BIDS ASKED: BA (new announcements only). For full calendar, see also preceding issues.
LOW BIDDERS: LB On jobs below $500,000 in value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a suuplementary contract award report will be published.
CONTRACTS AWARDED: CA Except awards to low bidders previously reported in low bidder stage.

CD dates shown are of Construction Daily issue in which last previous report was published.

Symbols and Abbreviations Include:

† Federal Government
▲ Project of $1,000,000 or over.
ENR Engineering News-Record
CD Construction Daily

For additional reports see Construction Daily.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **L-D Building Co.**, Latrobe, Pa., CA, sub-structure; **Navarro Corp.**, 6219 Broad St., Pittsburgh, Pa., CA, superstructure 340x480 ft., brick, block, steel frame, metals development PLANT, BLAIRSVILLE, PA. Total est. **$5,000,000.** Westinghouse Electric Corp., 401 Liberty Ave., **Pittsburgh, Pa. Bids June 7. CD 6/2.**

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ky., Louisville**—STATE FAIR PLANT—BA 9/2—State Div. Purchases, Frankfort, State Fair Plant, incl. stables, track, exhibit bldg. $7,500.000, Fred Elswick & Assoc., Commerce Bldg., archts. E. R. Ronald & Assoc., 554 S. Third St., Louisville, engrs. CD 12/27/48.

▲ **Ky., Louisville** — STADIUM — BA 9/9 — State Div. Purchases, Frankfort, rein.-con. stadium for new State Fair site, $2,500,000, Fred Elswick & Assoc., Commerce Bldg., archts. E. R. Ronald & Assoc., 554 S. Third St., engrs. CD 12/23/49.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **Ballenger Paving Co.**, Paris, Greenville, S. C. CA **$1,254,000.** addnl. aviation facilities, Spec. 35248, BEAUFORT, S. C. P. Wks. Office, U. S. Naval Base, Charleston, S. C. Bids June 10. CD 6/18, under LB.

▲ **KENTUCKY**—Commonwealth of Ky., Dpt. Hys., Frankfort,

R. B. Tyler Co., 1446 Levering St., Louisville, Ky. CA **$787,619.** bit. surf. Class I 2.111 mi. Louisville-Bardstown Rd. (Buechel By Pass), F 18 (5), F 18 (3), SP 56-118, SP 56-588, Jefferson Co.;

Ray Osborne & Kelly Contg. Co., Inc., Fincastle Bldg., Louisville, Ky. CA **$535,706.** bit. surf. Class I 4.648 mi. Somerset-Stanford Rd., F 502 (4), SP 100-535, Pulaski Co.;

State Contg. & Stone Co., Inc., Hartford, Ky. CA **$118,-980.** bit. surf. Class C-1 17.45 mi. various roads, SP 111-494, SP 111-234, Trigg Co. Grand total $1,442,-305. CD 7/15, under LB.

Ruby Constr. Co., E. Parkway, Louisville, Ky. LB **$188,-439.** Contr. 196 Northern Ditch Trunk Interceptor Sewer Sect. F, LOUISVILLE, KY. Metropolitan Sewer Dist., 414 W. Jefferson St., Louisville, Ky. Bids July 9. CD 11/6.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Doyle & Russell**, Central National Bank Bldg., Richmond, Va. CA Approx. $1,000,000. 2 story, bsmnt., 133x342 ft. rein.-con., masonry OFFICE, RICHMOND, VA. Chesapeake & Potomac Telephone Co., 703 E. Grace St., Richmond, Va. Bids July 16. CD 6/25.

▲ **Wise Contg. Co.**, Eighth and Grace Sts., Richmond, Va. CA Approx. **$1,000,000.** 4 story, bsmnt. OFFICE, RICHMOND, VA. Franklin Federal Savings & Loan Assn., 616 E. Franklin St., Richmond, Va. CD 9/17.

S. S. Jacobs & Co., Hildebrandt Bldg., Jacksonville, Fla., CA Approx. **$500,000.** WAREHOUSE, TAMPA, FLA. Kieckhefer Container Corp., c/o contractor.

▲ **L. P. Cox Co.**, Sanford, N. C. LB **$1,197,000.** renovating 6 WARD BLDGS. (Barracks Lane Group) Bldgs. 52, 56, 57, 69, 62, 64, BUTNER, N. C. State Hospitals Bd. Control, R. N. Purser, bus. mgr., Raleigh, N. C. Bids July 15. CD 6/22.

MIDDLE WEST

BIDS ASKED—BUILDINGS

▲ **Wis., Wauwatosa**—SCHOOL—BA 8/3—Lutheran High School Assn. of Greater Milwaukee, 1859 N. 13 St., Lutheran High School, $2,000,000. Grassold-Johnson & Assocs., 734 N. Jefferson St., Milwaukee, archts. Extended date . CD 6/30.

▲ **Mich., Coldwater**—SCHOOL—BA 8/17—Bd. Educ., high school, $1,300,000, Warren S. Holmes, 2200 Olds Tower, Lansing, archt. CD 9/29.

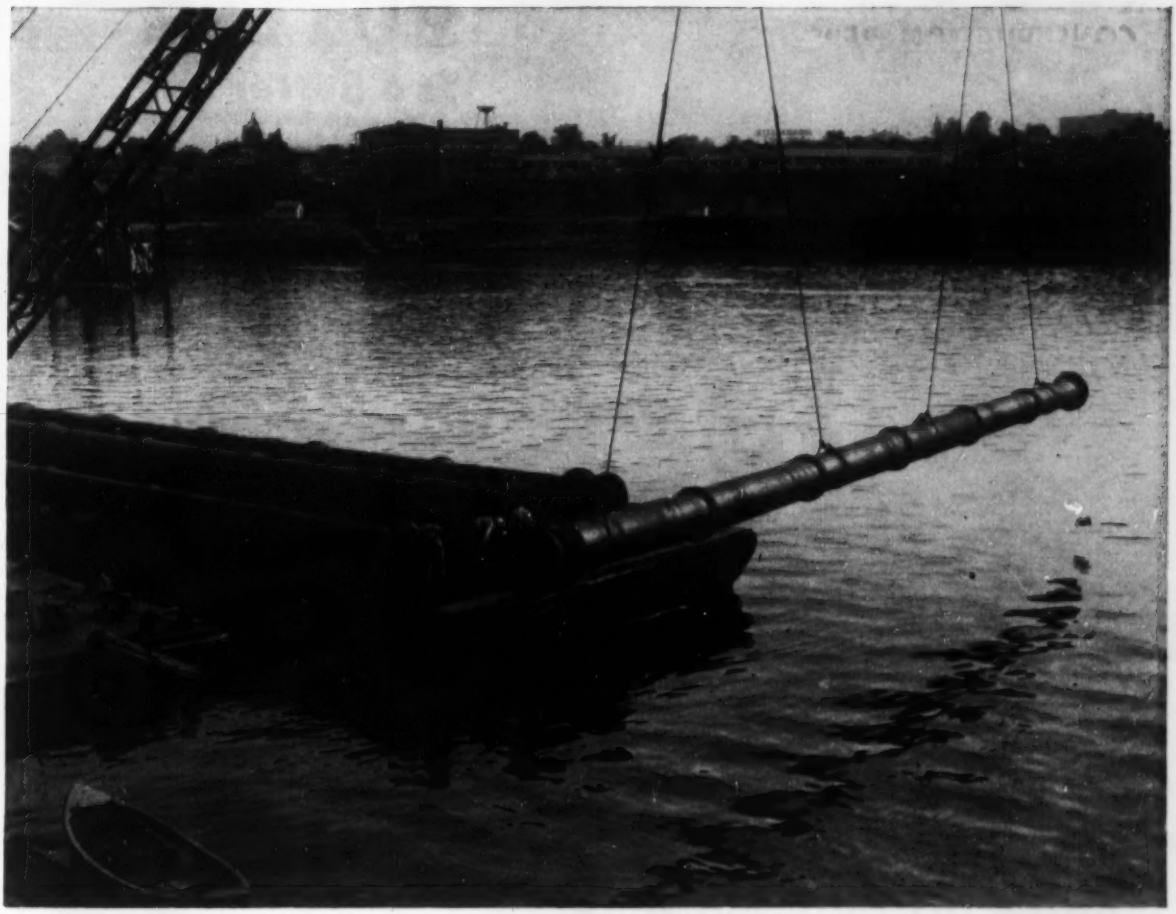
BUILDINGS

LOW BIDS AND CONTRACTS

Community Development, Inc., 9th-Chester Bldg., Cleveland 14, O. Own Forces. **$600,000.** 2-level approx. 50,000 sq. ft., brick and glass WAREHOUSE and OFFICE bldg., air-conditioned, E. 38 St. and Hamilton Ave., CLEVELAND, O. Main Line of Cleveland, 5005 Euclid Ave., Cleveland 3, O., lessee.

▲ **Rust Furnace Co.**, 575 Sixth Ave., Pittsburgh, Pa. CA Est. **$10,000,000.** billet heating furnace at Cuyahoga Works Rod MILL, CLEVELAND, O. United States Steel Corp., American Steel & Wire Div., Rockefeller Bldg., Cleveland 14, O. Floyd A. Garman, c/o owner, engr. CD 7/7/53.

(Continued on page 81)



AMERICAN Cast Iron Pipe For River Crossings

RIVER CROSSINGS and other underwater pipe installations present no problems when you select AMERICAN river crossing pipe. Designed to meet the severe requirements of submarine pipe lines, AMERICAN Molox Ball Joint river crossing pipe provides for expansion and contraction of the pipe line and at the same time is locked against separation. The joint remains bottle-tight under pressures up to several hundred psi at any angle within the range of approximately 15° deflection it provides.

AMERICAN river crossing pipe's rugged construction enables it to be pulled across streams with cables or laid direct from a barge or bridge. The illustration shows parallel 30" and 42" AMERICAN Double-X Mechanical Locked Joint pipe lines combined with Molox Ball Joint double hubs, being laid under the Willamette River at Portland, Oregon. A balanced free-swinging four-point hitch was used to lay the pipe. The river depth ranged from 30 to 70 feet and the lines were each 1500 feet in length.

AMERICAN Molox Ball Joint river crossing pipe is produced to national standard specifications in diameters 4"—30" in 16-foot lengths. It is centrifugally cast with integral bell and can be furnished tar coated, Enamelined, cement lined, Lumnite cement lined or with other special linings. AMERICAN pipe with other types of joints is manufactured in diameters ranging from 2"—48".

Whether it be underwater or overland, refer your next piping job to AMERICAN CAST IRON PIPE. Let us assist you by taking off lists of material and submitting prices on pipe and fittings—preferably when planning begins. Consulting with us imposes no obligation.

AMERICAN CAST IRON PIPE COMPANY

BIRMINGHAM 2, ALABAMA

MAIL COUPON FOR FREE CATALOG

American Cast Iron Pipe Company,
Birmingham 2, Alabama

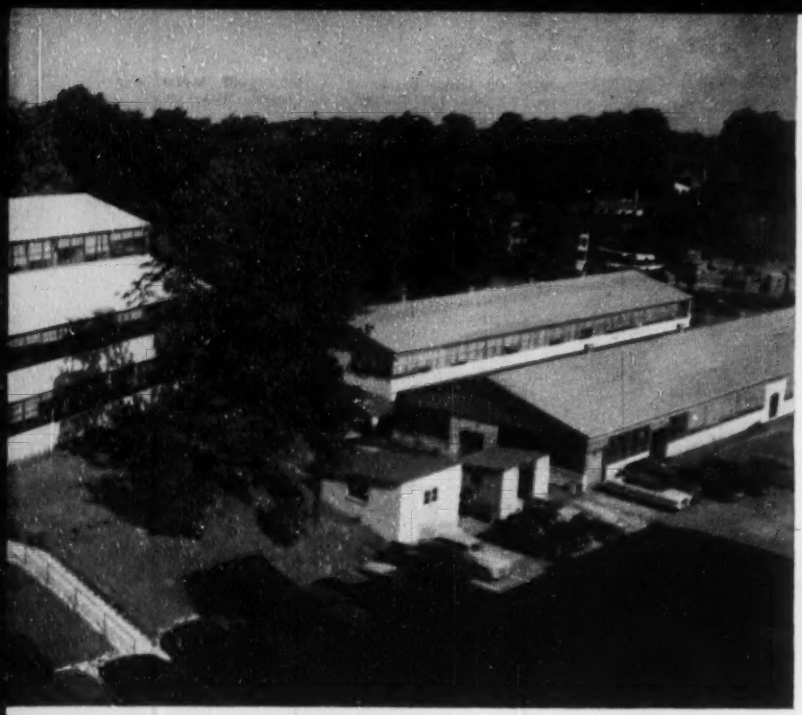
Gentlemen: Please send me a free copy of your illustrated catalog covering pipe for river crossings.

Name .....

Company .....

Street .....

City ..... State .....



Attractive-looking plant site at Remington Rand Advanced Research Laboratory owes much of its good looks to two aluminum-sheeted Butler buildings.

BUTLER buildings cut months off building time for Remington Rand

"We needed a building in a hurry when we signed the contract for the first of our two 50′ x 200′ aluminum-sheeted Butler buildings in 1948," reports Mr. S. E. Szemetko, plant engineer at Remington Rand's Laboratory for Advanced Research, Norwalk, Conn. "It was ready for use only 10 weeks later—which proved the value of Butler's fast delivery and quick erection.

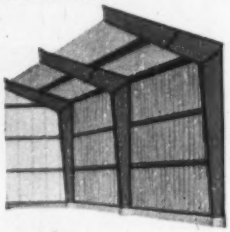
"Butler buildings also proved adaptable. When we built our 4-story office building in 1952, we economically combined Butler buildings with masonry construction. This provided the space we required, on a limited lot. We used a 40′ x 300′ Butler building for the entire fourth floor, and two 20′ x 300′ Butler sections on the sides of the third floor, totaling 24,000 square feet of well lighted, well insulated, functional office space."

Before you build—see your Butler dealer. He'll show you why corporations like Remington Rand, Deepfreeze, Coleman Company, Norwich Pharmacal, Santa Fe and Westinghouse use Butler buildings. He'll show you the pre-engineered, quality features that bring you superior, permanent construction, with clear-span interiors, rigid frame strength for suspending conveyors and monorails, better fire-safety. He'll show you real construction economy—in lower first cost, lower erection costs, lower maintenance. Write office nearest you for his name and more information by mail.

Here is why BUTLER is a better buy

Every Foot of Floor Space is Usable

There are no interior posts or columns to waste space and create work-slowing "bottlenecks." Rigid-frame construction also shrinks maintenance costs . . . extends building life.



Fast Erection . . . Easy Expansion

Precision-punched and dimensioned bolt holes speed erection—simplify expansion or dismantling and moving. Galvanized bolts, with Neoprene rubber washers, lock deep-corrugated sheets firmly to the sturdy frame.

Weatherproof Protection

The one-piece, die-formed roof ridge eliminates ridge roll—helps to make the building leakproof and weather-tight.

Triple-Strength Corrugated Sheets

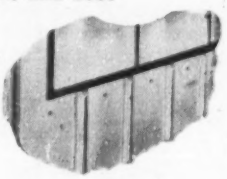
Butler sheeting with deep-formed corrugations on 12-inch centers, is three times as strong as ordinary corrugated sheets. Overlapping corrugations bolt tightly together for maximum strength and weather protection. Your choice of steel or aluminum sheeting.

Attractive Curved Eaves

The neat, die-formed eaves—which bolt to the roof sheets—add to the appearance of Butler steel buildings...increase the strength of the eaves . . . help insure weather-tightness.

Weather-sealed Windows and Base

Where corrugated sheets meet windows or the foundation, they are tightly crimped, for a snug fit that keeps out snow, moisture and rodents.



BUTLER STEEL PRODUCTS

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1028 Avenue W, Ensley, Birmingham 8, Alabama • Dept. 18, Richmond, California

Manufacturers of Oil Equipment • Steel Buildings • Farm Equipment • Cleaners Equipment • Special Products

Factories located at Kansas City, Mo. • Galesburg, Ill. • Richmond, Calif. • Birmingham, Ala. • Minneapolis, Minn.

(Continued from page 78)

▲ **West Kessler Homes, Inc.**, Speedway City, Ind., Owner Builds, $1,000,000, new group 70 HOMES, INDIANAPOLIS, IND.

▲ **H & H Builders**, 5425 College Ave., Indianapolis, Ind., Owner Builds, $1,000,000, new HOMES in Oxford Village, INDIANAPOLIS, IND.

▲ **Hunzinger Constr. Co.**, 4577 N. 124 St., Milwaukee, Wis., CA, $5,000,000, general contract 1 story 540x720 ft. FACTORY, WAUWATOSA, WIS. Briggs & Stratton Corp., 2711 N. 13 St., Milwaukee, Wis. Bids July 13. CD 7/9.

▲ **Jezo Constr. Co.**, 1909 S. 74 St., West Allis, 14, Wis., CA, $1,895,000, general contract, Longfellow Junior High SCHOOL, WAUWATOSA, WIS. Bd. Educ., 1732 Wauwatosa Ave., Milwaukee 13, Wis. Bids July 1. CD 7/6, under LB.

Jaress Constr. Co., Battle Creek, Mich. CA $907,135. general contract HOSPITAL at Coldwater State Home & Training School, COLDWATER, MICH. State, A. N. Languis, dir. State Bldg. Dpt., Lewis Cass Bldg., Lansing, Mich. Bids July 13. CD 6/30.

WEST OF MISSISSIPPI

BIDS ASKED—BUILDINGS

▲ **Tex., Houston**—MOTEL—Bids Asked—Western Skies Motel, c/o Leon Green, 2806 Old Spanish Trail, 75-unit motel. $1,000,000. CD 7/15.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **TEXAS**—State Hy. Comn., Austin,

Adams Bros., P.O. Box 271, Kaufman, Tex., LB $133,-696, grading, structures, base and surf. 5.284 mi. Hy. FM 2102, Proj. S 1995 (1), Rains Co.;

Austin Bridge Co., P.O. Box 1690, Dallas, Tex., LB $113,576. grading, structures, base, surf. 9.867 mi. Hy. FM 2093, Proj. C 1903-1-1, Gillespie Co.;

Austin Road Co., P.O. Box 1590, Dallas, Tex., LB $703,260, roadbed tr. and c. conc. 6.349 mi. Hy. US 77, Proj. C 196-1-12, Denton Co.; LB $182,365, flexible base, b. conc. 1.89 mi. Hy. US 69, Proj. F 355 (6), Hardin Co.;

Bryan & Hoffman, P.O. Box 390, Plainview, Tex., LB $171,175, flexible base, two course surf. tr. 10.693 mi. Hy. SH 70 and 256, Proj. S 53 (11), etc. Briscoe Co.;

A. L. Bucy, 804 Avenue 1, Brownwood, Tex., LB $78,-454. grading, structures, base, surf. 4.785 mi. Hy. FM 2063, Proj. S 1958 (1), Jack Co.;

R. B. Butler, Inc. & J. H. Howard, P.O. Box 471, Bryan, Tex., LB $201,249, grading, structures, base, surf. 7.257 mi. Hy. FM 1498, Proj. S 1866 (1), Lamar Co.;

Cage Bros., 6959 San Pedro St., San Antonio, Tex., LB $172,066, grading, structures, base, surf. 17.798 mi. Hy. FM 1749, Proj. S 1922 (1), Pecos and Terrell Counties; LB $301,882, grading, structures, base, surf. 17.997 mi. Hy. FM 1836, Proj. S 1904 (1), etc., Kaufman Co.;

Cooper & Woodruff, 222 Mays Bldg., Amarillo, Tex., LB $82,880, grading, structures, base, surf. 6.208 mi. Hy. FM 368, Proj. S 1213 (2), Archer Co.; LB $68,-941, grading, structures, base, surf. 6.127 mi. Hy. FM 281, Proj. R 1727-1-2, Hartley Co.;

Joe Davidson, P.O. Box 439, Terrell, Tex., LB $166,588, flexible base, two course surf. tr. 10.789 mi. Hy. SH 34, Proj. S 1905 (1), Hunt Co.;

Ivan Dement, Inc., P.O. Box 1787, Amarillo, Tex., LB $60,949, grading, structures, base and surf. 3.029 mi. Hy. FM 2124, Proj. R 1999-1-1, Hemphill Co.;

Dodds & Wedegardner, Inc., San Benito, Tex., LB $109,-066, wid'n., grading, structures and b. conc. 1.325 mi. Hy. US 77 and 83, Proj. F 93 (2), Cameron Co.;

F. & C. Eng. Co., P.O. Box 2426, Houston 1, Tex., LB $1,324,573, grading, storm sewers, cement, stabil. base and CP structures, etc. 1.517 mi. Hy. US 59, Proj. U 514 (14), Harris Co.;

Gaylord Constr. Co., 806 Blodgett St., Houston, Tex. LB $131,625, b. cnoc. 31.036 mi. Hy. US 281, Proj. F 1099 (2), Live Oak Co.;

Hugh McMillan, P.O. Box 1227, El Paso, Tex., LB $122,372, wid'n., grading, flexible base, one course surf. tr. 10.74 mi. Hy. US 80, Proj. C 1-1-17, etc., El Paso Co.;

Dean Skinner Contr., P.O. Box 4057, Austin, Tex., LB $140,954, grading, structures, base, surf. 12.361 mi. Hy. FM 969 and FM 1704, Proj. S 1394 (1), etc. Travis and Bastrop Counties; LB $205,144, grading, structures, base, surf. 11.54 mi. Hy. FM 2009 and 656, Proj. S 1274 (1), etc., Motley and Hall Counties;

Spencer Constr. Co., Inc. & Russell Smith, P.O. Box 487, Carrollton, Tex., LB $315,870, flexible base, two course surf. tr. 2.306 mi. Hy. ST 114, Proj. C 352-1&2-8&8, Wise Co. Bids July 13. CD 7/1, 6/28, 6/21.

FAR WEST

BIDS ASKED—BUILDINGS

▲ **Calif., Redwood City**—HALL OF JUSTICE and RECORDS—BA 8/17—San Mateo Co., Court House, Hall of Justice and Records, $1,750,000. Plans deposit $75, Michael Goodman, 2161 Shattuck Ave., Berkeley, archt. CD 4/18/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Oberg Bros. Constr. Co., P. O. Box 604, Inglewood, Calif., CA, $1,877,819, undercrossing, bridge, etc. Santa Ana Freeway, between Lyon St. and Santa Ana-Ramona Freeway Exchange, Los Angeles Co. Bids June 17, awarded July 9, CD 6/22, under LB;

Webb & White, 7220½ Melrose Ave., Los Angeles, Calif., CA, $687,879, superstructure for bridge, approaches etc. across Los Angeles River, South Gate, Los Angeles Co. Bids June 24, awarded July 10, CD 7/7, under LB.

▲ **CALIFORNIA**—State Div. Hys., P. Wks. Bldg., Sacramento,

Guy F. Atkinson Co., 10 W. Orange Ave., South San Francisco, Calif., CA, $1,321,240, grading, paving, 4 bridges 2.4 mi. between Tellman and Princeton Ave., Fresno, Fresno Co. Bids June 16, awarded July 9. CD 6/22, under LB.

▲ **CALIFORNIA**—State Div. Hys., 120 S. Spring St., Los Angeles,

Griffith Co., 1060 S. Broadway, Los Angeles, Calif., CA, $3,338,857, grading, paving, bridges 3.3 mi. Ramona Freeway, Los Angeles, Bids June 17, awarded July 9, CD 6/22, under LB;

Vinnell Co., Inc., & Vinell Constructors, 145 Westminister Ave., Alhambra, Calif., CA, $3,077,969, grading, paving, bridges etc. 2.8 mi. Harbor Freeway, Los Angeles Co., Bids June 10, awarded July 9, CD 6/16, under LB;

Webb & White, 7220½ Melrose St., Los Angeles, Calif., CA, $1,134,789, grading, bridges 0.5 mi. Fourth St. St. between Hill St. and Harbor Freeway, Los Angeles Co., Bids June 24, awarded July 9, CD 7/2, under LB. Grand total $7,551,615.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **L. H. Hoffman Co.**, 715 S. W. Columbia St., Portland, Ore., CA, $3,210,000. Woodrow Wilson HIGH SCHOOL, PORTLAND, ORE. Multnomah Co. School Dist. 1, 631 N. E. Clackamas St., Portland, Ore., Bids July 12. CD 6/18.

▲ **L. H. Hansen & Sons**, Box 1784, Fresno, Calif., CA, $1,697,984, GYMNASIUM, Bakersfield College, BAKERSFIELD, CALIF. Kern County Union High School and Junior College Dist., 312 Bernard St., Bakersfield, Calif. Bids July 2, awarded July 12. CD 7/12.

▲ **Williams & Burrows, Inc., and Carl N. Swenson**, 500 Harbor Blvd., Belmont, Calif., CA, $1,185,800 women's RESIDENCES at Santa Barbara College, GOLETA, CALIF. University of California, Goleta, Calif. Awarded July 9.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Rayner Constr. Ltd.**, 29 Commercial Rd., Leaside, Toronto, Ont. CA $1,500,000. airport work, runway, exten. to 7,000 ft. by 200 ft., strengthening existing runway pavement, taxi strips, etc., TORBAY, NEWFOUNDLAND. Dpt. Transport, Hunter Bldg., Ottawa, Ont. Bids June 15, awarded July 10. CD 6/3.

BUILDINGS

LOW BIDS AND CONTRACTS

Acme Constr. Co. Ltd., 45 Canterbury St., St. John, N. B. CA $593,084. 2 SCHOOLS, Crescent Valley and Portland Place connecting bldg. housing common auditorium to both schools, ST. JOHN, N. B. Bd. School Trustees, St. John, N. B. Bids July 6. CD 6/23.

▲ **Bird Construction Co. Ltd.**, 202 13 St. N., Lethbridge, Alta., CA, $1,065,000, 2 story, 124x143 ft., concrete, brick, DEPARTMENT STORE addn., 4 Ave., LETHBRIDGE, ALTA. T. Eaton Co. Ltd., 190 Yonge St., Toronto, Ont. Awarded July 14. CD 8/25.

▲ **Peter Leitch Construction Co. Ltd.**, 170 Scott St., Winnipeg, Man., CA, $1,440,000, Army Base Development, about 20 permanent buildings, at Fort Osborne Barracks, WINNIPEG, MAN. Defence Constr. (1951) Ltd., 56 Lyon St., Ottawa, Ont. Awarded July 12. CD 3/3.

▲ **Ross-Meagher Ltd.**, 9 Echo Dr., Ottawa, Ont. CA Est. $1,000,000. HOSPITAL addn., alterations, OTTAWA, ONT. Perley Home for Incurables Bd., Aylmer Ave., Ottawa, Ont. Bids June 22. CD 6/8.

▲ **Foundation Co. of Canada Ltd.**, 1220 Bay St., Toronto, Ont. CA Est. $1,000,000. superstructure 3 story, steel, brick 37,000 sq. ft. first floor BOTTLING and SERVICE PLANTS, TORONTO, ONT. Molson's Brewery (Ontario) Ltd., 1670 Notre Dame St. E. Montreal, Que. Stone & Webster Canada Ltd., 44 King St. W., Toronto, Ont., engr. Awarded July 12. CD 6/16 .

ALASKA

BIDS ASKED—BUILDINGS

† **Alaska, Seward**—HIGH SCHOOL—BA 8/4—Alaska P. Wks., Dpt. Interior, P.O. Box 1181, Juneau, 2 story high school. Proj. Aaa 50. $951,000. Plans deposit $25. Extended date. CD 6/25.

Proposed Projects

WATER SUPPLY

▲ **Colo., Pueblo**—South Side Water Bd., Pueblo, bond election Aug. 10, water imprvs. $3,000,000.

▲ **Mich., Holland**—City, Clarence Grovengood, clk., municipal water sys. plant tunnel Park on Lake Michigan, $3,000,000, Black & Veatch, 4706 Broadway, Kansas City, Mo., consult. engrs. CD 6/28.

SEWERS, WASTE DISPOSAL

▲ **Ky., Louisville**—Meteopolitan Sewer Dist., 414 W. Jefferson St., sewer projects for next 5 years, Incl. 2 sewage disposal plants, $25,000,000, Metcalf & Eddy, 1300 Statler Bldg., Boston, Mass., consult. engrs. CD 11/6.

▲ **O., Brook Park**—Village, 5950 Eastland Rd., Brook Park, Cleveland, P.O. bond election Nov. 2, sewers. $1,800,000. C. W. Courtney Eng. Co., The Arcade, Cleveland, Zone 14, consult. engr. CD 4/21.

BRIDGES

▲ **MICHIGAN**—State Hy. Dpt., Stevens T. Mason Bldg., Pine and Michigan Ave., Lansing.

Ingham Co.—grade separation proj. East Saginaw St., incl. wid'n. E. Saginaw from N. Washington Ave. to Pennsylvania Ave. and underpass beginning at Larch St. cross overs between 2 streets at Cherry and Clare Sts., Lansing, $6,000,000. Harry C. Coons, ch. engr.

▲ **O., Columbus**—City, City Hall, bond election Nov. 2, railroad grade crossing, elimination, $2,000,000. CD 1/18/45.

STREETS AND ROADS

▲ **Tex., San Antonio**—City, Ralph Winton, mgr., City Hall, voted bonds July 10, exten. expressways. $11,-000,000. CD 6/15.

EARTHWORK, WATERWAYS

▲† **Missouri and Arkansas**—U. S. Eng., P.O. Box 867, Little Rock, Ark., 6,400 ft. concrete gravity Table Rock Dam in White River near Branson, Mo. $4,850,-000 available. (Total cost of dam and reservoir $35,000,000. Entire cost of project incl. power house, equipment, roads, utilities and site, $78,000,000). CD 10/13/52.

▲ **Wash., Tacoma**—City, City Hall, hydro dam on Lower Nisqually River near mouth of Ohop Creek. $15,000,000.

AIRPORTS

▲† **Calif., Muroc**—B O Q, TRAINING BLDG., etc.—U. S. Eng., 751 S. Figueroa St., Los Angeles, BOQ, training bldg., fencing, standards, reproduction bldg., Edwards Air Force Base $1,647,000. Lunden, Hayward & O'Connor, 548 S. Spring St., Los Angeles, engrs. CD 2/10/52.

▲† **N. Y., Plattsburgh**—AIRFIELD FACILITIES, etc.—U. S. Eng., 80 Lafayette St., New York, Zone 13, airfield facilities and Bldgs., FY 1955, 1956, $5,000,-000, Seelye, Stevenson, Value & Knecht, 101 Park Ave., New York, Zone 17, engrs; plans by Ziegler, Childs & Paulson, 921 Bergen Ave., Jersey City, N. J., hospital and dental clinic, $3,000,000-$5,000,000 at Plattsburgh Air Force Base. CD 10/15/52.

PUBLIC BUILDINGS

▲ **Ala., Montgomery**—COURTHOUSE—Montgomery Co., plans by Pearson, Tittle & Narrows, First National Bank Bldg., courthouse. $2,000,000.

▲† **California**—PLANT—U. S. Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash., D. C., sodium-graphite reactor plant, north of Los Angeles in Santa Susanna Mountains. $10,000,000. North American Aviation, Inc., International Airport, Los Angeles, will operate.

▲ **Ill., Wilmette**—HIGH SCHOOL—School Dist. 39, 738 10th St., plans by Ganster & Henninghausen, 222 Washington St., Waukegan, Highcrest Grade and Howard Junior High School and Harper Grade School. $2,000,-000. CD 10/6/49.

▲ **Mass., Boston**—ARMY BASE—Commonwealth of Mass., Port of Boston Comn., John M. Bresnahan, dir., Commonwealth Pier No. 5, South Boston, rehabilitation and modernization Army Base, South Boston, $11,000,000.

▲ **Mass., Taunton** — ADMISSION-TREATMENT — State, Dpt. Mental Health, c/o Div. Bldg. Constr., 38 Chauncy St., Boston, plans by Cram & Ferguson, 248 Boylston St., Boston, PM-26 admission treatment bldg., State Hospital. $2,000,000. CD 9/26/49.

▲ **N. Y., Brooklyn**—HIGH SCHOOL—Bd. Educ., 49 Flatbush Ave. exten., Zone 1, plans by Katz, Weisman, Blumenkranz, Stein & Weber, 551 Fifth Ave., New York, Zone 17, 4 story William E. Grady Vocational High School, 25 Brighton Fourth Rd. $4,495,000. CD 2/10/44.

▲ **N. Y., Carle Place** — HIGH SCHOOL — Carle Place School Bd., Carle Place, Junior-Senior High School, 44-acre tract, Cherry Lane near Asbury Ave. $2,000,-000. CD 10/5/51.

▲ **O., Cleveland**—COUNTY OFFICE—Comrs., Cuyahoga Co., 135 Court House, Zone 14, bond election Nov. 2, six story county office bldg. $4,000,000. A. S. Porter, Standard Bldg., Zone 14, co. engr. CD 11/6/53.

COMMERCIAL BUILDINGS

▲ **Calif., Anaheim**—SHOPPING CENTER, etc.—Broadway-Hales Stores, c/o Broadway Dpt. Store, 401 S. Broadway, Los Angeles, shopping center and department store, near here. $7,000,000. Welton Becket & Assoc., 5657 Wilshire Blvd., Los Angeles, consult.

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at easy, long-life engine speeds.

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▲ **Conn., Stamford**—APARTMENT—Hoyt-Bedford Co., 300 Main St., plans by Philip Birnbaum, 12 E. 48 St., New York, N. Y., six 5 story apartments, 330-dwelling units. $4,700,000.

▲ **Md., Rockville**—SHOPPING CENTER—Syndicate, incl. Shannon & Luchs Co., 1505 H St., N. W., Wash., D. C., project abandoned, Rockville Plaza Shopping Center, Rte. 240 jct. with N. Washington St. $2,500,000. Wilson & Denton Assoc., 1022 20 St. N. W., Wash., D. C., archts. CD 4/26.

▲ **Minn., Minneapolis**—OFFICE—Hardware Mutual Insurance Co., 2344 Nicollet Ave., plans by Thorshov & Cerny, 400 Metropolitan Bldg., 3 or 4 story, 100x300 ft. insurance office, NW shore of Lake Calhoun. $2,000,000.

▲ **N. Y., Levittown**—STORE—Berger-Tilles Projects, 64 Division Ave., plans by Leo V. Berger, 356 Fulton St., Brooklyn, Zone 1, 2 story store bldg. addn. to Levittown Shopping Center to be occupied by Mays Dpt. Store. $2,000,000.

▲ **N. Y., New York**—HEADQUARTERS—Seagram-Distillers Corp., 405 Lexington Ave., Zone 17, plans by Pereira & Luckman, 8 E. 54 St., Zone 22, 34 story headquarters bldg., Park Ave. between 52 and 53 Sts. $15,000,000.

▲ **O., Richmond Heights**—DWELLINGS—Hilltop Realty Co., Henry Petti, vice pres., 5148 Mayfield Rd., Lyndhurst, Zone 24, 157 brick, stone dwellings, Old Richmond Country Club Property. $3,150,000.

▲ **Tenn., Memphis**—HOSPITAL—Methodist Hospital, 1265 Union Ave., plans by Walk C. Jones, Jr., 1215 Poplar Ave., hospital addn. $3,100,000.

▲ **Tex., Houston**—MEDICAL—Martin Nadelman (Medical Towers Bldg.) 5305 Blythewood St., plans by Golemon & Rolfe, 5100 Travis St., Houston, Tex., and Skidmore, Owings & Merrill, 575 Madison Ave., New York, N. Y., 18 story medical bldg. $5,000,000. Bernard Johnson & Assocs., 4926 Travis St., and Walter P. Moore, 2 Pinedale St., consult. engrs. CD 5/28.

▲ **Va., Richmond**—HOTEL—Richmond Hotels, Inc., 9 and Grace Sts., 15 story addn. to John Marshall Hotel, 9 and Grace Sts. $2,000,000.

▲ **Va., Richmond**—STORE—Thalhimer Bros., Inc., Broad St., plans by Copeland, Novack & Assocs., 142 E. 51 St., New York, N. Y., 6 story, bsmnt. 60,000 sq. ft. department store addn. $2,500,000.

INDUSTRIAL BUILDINGS

▲ **Ala., Sheffield**—MILL—Reynolds Metals Co., 2500 S. Third St., Louisville, Ky., mill addn. $2,000,000.

▲ **Calif., Anaheim**—LABORATORY—Richfield Oil Co., 555 S. Flower St., Los Angeles, research laboratory, 5 bldgs., pilot plant and tanks. $3,000,000.

▲ **Del., Delaware City**—REFINERY—Tidewater Associated Oil Co., 17 Battery Pl., New York, N. Y., refinery, $75,000,000. C. F. Braun & Co., 1000 S. Fremont Ave., Alhambra, Calif., consult. engrs.

▲ **Ill., Chicago**—WAREHOUSE, etc.—Aldens, Inc., 1417 W. Jackson St., plans by A. Epstein & Sons Co., 2011 Pershing St., Zone 9, 600,000 sq. ft. Mail Order Warehouse and Office, Roosevelt Rd. and Cicero. $7,500,000. CD 1/29/46.

▲ **Ill., Chicago**—PLANT—Field Enterprises, Inc., 211 W. Wacker Dr., plans by Naess & Murphy, 80 E. Jackson St. Zone 4, plant for publication of Chicago Sun-Times, Wabash and N. Bank Dr. $2,000,000.

▲ **Kan., Wichita**—PLANT—Kansas Gas & Electric Co., 201 N. Market St., steam electric plant. $16,000,000.

▲ **O., Willoughby**—PROCESSING UNITS, etc.—Barium & Chemicals, Inc., 4043 Erie St., processing units warehouse, research laboratory and office, $3,500,000.

▲ **Pa., Sharon**—LABORATORY—Westinghouse Electric Corp., P.O. Box 868, Pittsburgh, Zone 30, plans by Commonwealth Assocs., 252 W. Cortland St., Jackson, Mich. for building, 70x56x55 ft. concrete, fiberglass, steel, concrete soundproof laboratory to test transformers. $2,000,000. Prack & Prack, Martin Bldg., Pittsburgh, consult. engr. on test area.

▲ **Tex., Freeport**—REFINERY—Avtane Refining Co., c/o Wm. V. Bentley, Jr. & Assocs., 719 Duncanville St., Dallas, refinery, $15,000,000; pump station in refinery area, $350,000. south of Bryan Mound Rd., near here.

▲ **Tex., Houston**—PLANT—Texas Butadiene & Chemical Corp., c/o Dr. Robert L. Purvin, pres., Reserve Loan Life Bldg., Dallas, butadiene and alkylization plant, $22,500,000. Purvin & Gertz, Reserve Loan Life Bldg., Dallas, consult. engrs. CD 7/13.

▲ **B. C., North Vancouver**—DISTILLERY—Canadian Schenley Ltd., 536 Howe St., Vancouver, distillery, $7,000,000. CD 7/8.

▲ **N. S., Halifax**—GENERATING PLANT—Nova Scotia Light & Power Co., Barrington St., steam turbo-generating plant, $7,000,000.

▲ **Ont., Hamilton**—BREWERY—Brading's Brewery Ltd., 297 Victoria St., Toronto, brewery imprvs., plant addns., Eastwood Park, $5,000,000, T. G. Ferguson, c/o owner, engr.

UNCLASSIFIED

▲ **Tex., Dallas**—BASEBALL PARK, etc.—Dallas Baseball Club, c/o Buddy Fogelson, 1500 E. Jefferson St., enlarging baseball park and stadium. $2,000,000.

▲† **Utah**—TRACK—Coleman Engineering, Inc., 11421 Knightsbridge St., Los Angeles, Calif., special track to test bail-out devices in Southern Utah. Site not selected, for the Air Research and Development Command, 5 W. Baltimore St., Baltimore, Md. $2,000,000.

How Du Pont "Team" Helped Tame Toughest 6 Miles of Turnpike Project

Produced maximum fragmentation with minimum backbreak

1. In grading Contract #25 of the West Va. Turnpike, S. J. Groves & Sons Co. had a rugged job on their hands: 6.3 miles of sandstone and silica shale! To handle it, this Minneapolis contractor used a Du Pont blasting "team." Here's a "member," Du Pont Special Gelatin 40%, being loaded into holes.

2. Connected up and ready to fire, this 900-hole shot contained 10,000 lbs. of Special Gelatin 40%. Groves used Du Pont MS Delay Electric Blasting Caps to prime all shots, many of which exceeded 1000 holes. Maximum fragmentation with minimum backbreak was the objective—and result.

3. Du Pont CD-48 Blasting Machine fired all shots. This portable 27-lb. source of power consistently fires up to 1200 caps in parallel series. It has no moving parts, eliminates the human element of generator-type machines, and removes need for power lines or portable generators for blasting.

4. Well-broken rock produced with Du Pont Special Gelatin 40% and "Red Cross Extra." Over 3,000,000 cubic yards of rock had to be blasted and moved on this contract. A difficult job . . . one of the toughest on the 88-mi. throughway . . . yet Groves pushed it through on schedule.

For complete information on Du Pont "teams": explosives, blasting supplies and accessories . . . contact your Du Pont representative. He can help you determine the combination best suited to your needs. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

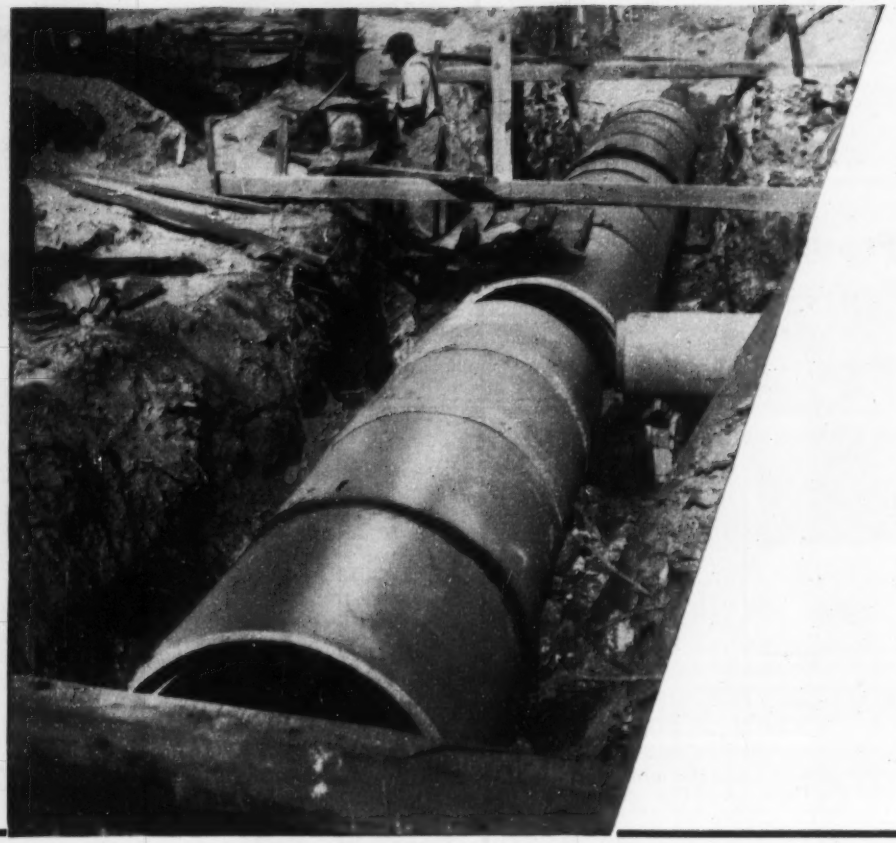
DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT

REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



OWNER:
Baltimore County Commissioners — Contract development located at Old Hartford Road and Satyr Hill Road, Baltimore County, Md.

CHIEF ENGINEER:
Charles B. Wheeler

CONTRACTOR:
John Matricciani Construction Co., Baltimore, Maryland

WITH "U. S." IT'S "FOR KEEPS"

When you specify U. S. Concrete Pipe or Universal Vitrified Sewer Pipe, you get quality that lasts . . . that is **for keeps.**

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Sewer Pipe (Vitrified)	Slipseal Sewer Joint	Flue Lining
Sewer Pipe (Concrete)	Segment Sewer Block	Stove Pipe
Vitrified Liner Plates	Meter Boxes	Chimney Tops
Tylox Flexible Rubber Coupled Vitrified Pipe	Ship Lap Wall Coping	Chimney Pots
	Septic Tanks	Fire Brick
Aerodrane Filter Block	Drain Tile	Fire Clay

Vitrified Clay Plate Lined Concrete Pipe
Conduit for underground steam and insulated piping

SALES OFFICES:

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PHILADELPHIA, PA. — P. O. Box 30, BRISTOL, PA.	Tel. Enterprise 6015 Tel. Bristol 8-5571
CINCINNATI, OHIO — P. O. NEWTOWN, OHIO — Box 215	Tel. Locust 7846

FACTORIES:
BALTIMORE, MD., CINCINNATI, OHIO, NEW PHILADELPHIA, OHIO, PALMYRA, OHIO (2), PHILADELPHIA, PA., UHRICHSVILLE, OHIO (2)

UNIVERSAL SEWER PIPE CORPORATION
UNITED STATES CONCRETE PIPE CO.

● ***GENERAL OFFICES*** • **1500 Union Commerce Building** • **CLEVELAND 14, OHIO**

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 10 Massachusetts
STREETS AND ROADS
August 3 Massachusetts

BUILDINGS

LOW BIDS AND CONTRACTS

Hersey Realty Co., Natick, Mass. Owner Builds. CA $875,000. RESIDENTIAL DEVELOPMENT, 57 residences, Oakdale and Saxonville Districts, FRAMINGHAM, MASS.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
August 3 Maryland — August 6 Pennsylvania
August 9 New Jersey

▲† **N. Y., West Point**—BA 9/1—U. S. Eng., 80 Lafayette St., New York, Zone 13, sewage disposal plant, $1,000,000-$3,000,000. Extended date. Alexander Potter 50 Church St., New York, Zone 7, archt. CD 7/15.

BIDS ASKED—BUILDINGS

▲ **Md., Baltimore**—SCHOOL—BA 8/4—City, Bureau Bldg. Constr., 410 Municipal Bldg., Zone 2, Pimlico Junior High School. $2,500,000. Plans deposit $50. Taylor & Fisher, 1012 N. Calvert St., archts. CD 11/24/52.

▲ **Md. Baltimore**—CATHEDRAL—BA 8/12—At office Maginnis & Walsh, archts., 126 Newbury St., Boston, cut stone cathedral, for Diocese of Baltimore, Chancery Office, 408 N. Charles St., Baltimore, Md. $7,000,000. CD 2/9/53.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **PENNSYLVANIA**—Pennsylvania Turnpike Comn., 11 N. Fourth St., Harrisburg,
Marsolino Constr. Co., Uniontown, Pa., LB, $2,278,066, 4.05 mi. Northeastern Extension Section 35-C, Worchester, Upper Gwynedd and Towamenoin Twps., Montgomery Co. Bids July 21. CD 7/7.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Briar Point At Bay Shore Homes**, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds, $3,000,000, 325 HOUSES on 112-acre tract at Sunrise Hy. and Atlantic Ave., BAY SHORE, N. Y.

▲ **Todd Estates Homes**, c/o Henry Aklar Realty Co., 220-02 Horace Harding Blvd., Bayside Hills, N. Y. Owner Builds, $2,000,000, 70 HOUSES on tract at Roosevelt St. and Harding Pl., GLEN HEAD, N. Y.

▲ **New Hyde Park Estates**, c/o Trylon Realty Co., 98-89 Queens Blvd., Forest Hills, N. Y., Owner Builds, $3,750,000, 188 HOUSES on tract on Old Country Road between Denton Ave. and Shelter Rock Road, NEW HYDE PARK, N. Y.

▲ **Strathmore Manor Homes**, c/o Alwin Cassens Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds, $3,600,000, 120 HOUSES on 32-acre tract at Crisfield St. and Eisenhower Dr., YONKERS, N. Y.

▲ **Laurel Ridge Estates Homes**, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y., Owner Builds, $1,750,000, 125 HOUSES on tract at Manetto Hill Rd. and Washington Ave., PLAINVIEW, N. J.

▲ **North Haven Shores Homes**, c/o Caleb Hornbostel, archt., 112 E. 19 St., New York 3, N. Y. Owner Builds, $13,000,000, 500 HOUSES on 560-acre tract on Peconic Bay, opposite Shelter Island, NORTH HAVEN, N. Y.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 10 Florida
STREETS AND ROADS
August 10 Florida

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Richards & Assocs.**, P. O. Box 88, Carrollton, Ga., LB, $1,386,439, Contract 1;
Patterson Contractors, 2707 Seventh Ave., Birmingham, Ala., LB, $291,297, Contract 2, $306,314, Contract 4;
L. P. Wilder, P. O. Box 5387, Birmingham, Ala., LB, $204,990, Contract 3; $146,974, Contract B, natural gas system, CRESTVIEW, FLA. City, City Hall, Crestview, Fla. Bids July 6. CD 6/30.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
August 3 Illinois, Wisconsin
BRIDGES
August 2 Ohio — August 3 Illinois, Wisconsin

BIDS ASKED—BUILDINGS

▲ **Wis., Milwaukee** — HOSPITAL — BA 8/16 — Mount Siani Hospital, 908 N. 12 St., Zone 3, 6 story, T-shaped, 42x220 ft., 42x550 ft., concrete, brick, hospital addn. $2,400,000. A. Epstein & Sons, 2011 W. Pershing Rd., Chicago, Ill., archts. CD 9/18.

▲ **Wis., Mendota**—GENERATING PLANT—BA 8/19—Wisconsin Dpt. P. Wks., Madison, steam generating plant, State Hospital, $1,500,000. Battey & Childs, 231 S. La Salle St., Chicago 4, Ill. engrs.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **OHIO**—State Hy. Dpt., Columbus,
The A. Bentley & Sons Co., 201 Belmont Ave., Toledo, O. CA $1,308,000, est. $1,401,800. Type T-71 and structures 2.877 mi. S.R. 120, Sect. 3 Part No. 4-Toledo Expressway System, Front St. Interchange, UI 1052 (10), Lucas Co.;
John G. Witten, Sardis, O. CA $103,566, est. $114,104 Type T-31 105 mi., Proposals Nos. 1 to 13, Carroll, Guernsey, Harrison, Jefferson, Tuscarawas Counties. CD 7/14, under LB.

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,
A. J. Baltes, Inc., 11 Olive St., Norwalk, O. CA $5,533,897. grading, drainage, structures, paving approx. 4 mi. C-23, Loraine Co. CD 7/13, under LB.

▲ **American Bridge Div. of U. S. Steel Corp.**, 208 S. LaSalle St., Chicago, Ill., CA, $3,800,000. steel superstructure for 3,690 ft. natural gas pipe line suspension bridge with 2,150 ft. main span across Mississippi River at Grand Tower, Ill., and near Wittenberg, Mo. ILLINOIS-MISSOURI. Texas Illinois Natural Gas Pipeline Co., 20 N. Wacker Dr., Chicago, Ill. CD 9/17/53, under Missouri and Illinois.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Gallenstein Bros.**, 6901 Morrison Pl., Madeira, O. Owner Builds. $1,980,000. one hundred and eighty 1 story, bsmnt. HOMES on new streets off Rte. 50 east of MILFORD, O. Carl A. Rehring, 6926 Mt. Vernon St., Mariemont, O., engr. Awarded July 15.

▲ **Crestline Homes**, 3822 W. 63 St., Chicago, Ill., Own Forces, $3,000,000, 240 HOMES, area of Crawford Ave. and 79 St., CHICAGO, ILL.

▲ **Sedler Constr. Co.**, 9553 S. Hamilton St., Chicago, Ill., Own Forces, $4,000,000, 340 HOMES, south of Oak Lawn in Worth and Chicago Ridge, CHICAGO, ILL.

▲ **Granger Brothers**, 2702 S. Cedar St., Lansing, Mich. LB, $2,108,900, est. $2,000,000. general contract North Side Junior HIGH SCHOOL, LANSING, MICH. City, Teresa V. Darling, secy, Bd. Educ., 419 N. Capitol St., Lansing, Mich. Bids July 12. CD 6/25.

▲ **Arlington Heights Development Co.**, Fred Gattegno, pres., 12726 Vernon St., Huntington Woods, Mich. Owner Builds. $3,500,000. nineteen 2 story APARTMENTS, incl. 300 units, Thirteen Mile Rd. and Crooks St., ROYAL OAK, MICH.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
August 5 Kansas

BIDS ASKED—BUILDINGS

▲ **Colo., Denver**—COUNTY JAIL—BA 8/18—City and Denver Co., City and County Bldg., 12 one story county jail buildings, $2,000,000. Parr & Aderhold, 109 N. Robinson St., Oklahoma City, Okla., engrs. G. Meredith Musick, 1000 Patterson Bldg., archt. CD 9/25.

▲ **Tex., Houston**—APARTMENTS—Bids Asked—Lamar Gardens Apartments, O. R. Winter, 2480 Times St., 336-unit masonry garden type apartments. $3,000,000. Jos. B. Reynolds, 2480 Times St., archt. CD 6/18.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **TEXAS**—State Hy. Comn., Austin,
F. & C. Eng. Co., P.O. Box 2426, Houston 1, Tex., CA, $1,324,573, grading, storm sewers, cement, stab. base and CP structures 1.517 mi. Hy. US 59, Proj. US14 (14) Harris Co. Bids July 13, awarded July 19. CD 7/19, under LB.

▲ **Fisher Constr. Co.**, 2201 S. 19 St., Phoenix, Ariz., LB, $2,247,672, est. $3,000,000. 1850 ft. Montgomery Dam Rock Fill Dam, 108 ft. high, with concrete spillway, 100 ft. bridge and outlet conduit with required control valve, COLORADO SPRINGS, COLO. City, City Hall, Colorado Springs, Colo. Bids July 12. CD 6/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† **C. L. Browning Jr.**, Box 5008, Beacon Hill Station, San Antonio, Tex., CA, $6,810,817, ORDNANCE STORAGE project, near Kelly Air Force Base, TEXAS, U. S. Eng., P. O. Box 1229, Galveston, Tex. CD 7/15, under LB.

▲ **Walsh & Burney Co.**, 928 North Flores St., San Antonio, Tex., LB, $1,799,330, 2 bsmnt., 87x649 sq. ft. solid masonry finished with polished Austin cut stone Federal Reserve BANK, SAN ANTONIO, TEX. Federal Reserve Bank of Dallas, 127 Navarro St., San Antonio, Tex. Bids July 20. CD 6/23.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Calif., Muroc**—FACILITIES—BA 8/17—U. S. Eng., 751 S. Figueroa St., Los Angeles, hydro-dynamics test facilities, Edwards Air Force Base, ENG-04-353-55-4, $1,116,000. CD 3/3.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Schmidt Constr. Co.**, 10145 W. Colfax Ave., Denver, Colo., CA, $689,510, sewage collection lines, Group C; CA, $934,372. sewage collection lines, Group B;
Kloepfer Constr. Co., 900 E. Center St., Logan, Utah, CA, $524,275, sewer collection lines, Group D;
Statewide Plumbing & Heating, 4474 S. Main St., Salt Lake City, Utah, CA, $1,093,259, sewage collection lines, Group A, SALT LAKE CITY, UTAH Bd. Comn. Salt Lake Co., Box 206, City-County Bldg., Salt Lake City, Utah. Grand total $3,241,416. Bids June 17. CD 6/30, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **A. L. LaPierre & J. Peterson**, Times Square, Seattle 1, Wash., Day Labor, $4,000,000. 400 HOUSES in Mountlake Terrace north of SEATTLE, WASH.

CANADA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **BRITISH COLUMBIA**—B. C. Toll Hys. & Bridges Auth., Victoria,
Northern Constr. Co. & J. W. Stewart Ltd., 1304 Hornby St., Vancouver, B. C., LB, $1,699,069 7,000 ft. Agassiz-Rosedale Bridge;
Dominion Bridge Co. Ltd., 2450 Boundary Ave., Vancouver, B. C., LB $372,727, approach, steel work, about 1,873 tons, for Agassiz-Rosedale Bridge, Victoria. Bids July 14. CD 6/8.

▲ **Canada Wire & Cable Co. Ltd.**, 147 Laird Dr. N., Leaside, Ont., CA, approx. $20,000,000. four 31 mi. underwater cables, North Shore to South Shore of St. Lawrence River, Rimouski, QUEBEC. Hydro-Electric Power Comn., Quebec City, Que. CD 8/7/52.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Canadian Kellogg Co.**, Edmonton, Alta., CA, $4,000,000, REFINERY addn. on Highway No. 16, EDMONTON, ALTA. McColl-Frontenac Oil Co., 360 St. James St. W., Montreal, Que. CD 10/23.

▲ **National Housing, Inc.**, 5504 Verdun Ave., Montreal, Que., Owner Builds, $3,120,000, 50-unit HOUSING, R.R. No. 4, ST. JOACHIM DE CHATEAUGAY, QUE. R. Chalifoux, 6275 Papineau Ave., Montreal, Que., archt.

▲ **E. G. M. Cape & Co.**, 520 Cathcart St., Montreal, Que., CA. Total est. $20,000,000; excavation work for new HOTEL, Dorchester and Mansfield Sts., MONTREAL, QUE. Canadian National Rys., R. O. Stewart, ch. engr., 360 McGill St., Montreal, Que. CD 8/19.

▲ **Pigott Constr. Co. Ltd.**, 36 James St. South, Hamilton, Ont., CA, $1,500,000, 1 story bsmnt., 180x250 ft., concrete, steel, brick PLANT OFFICE, OSHAWA, ONT. General Motors Co. of Canada Ltd., William St. E., Oshawa, Ont. Allward & Gouinlock, 57 Bloor St. W., Toronto, Ont., archts. Awarded July 15. CD 5/5.

▲ **Const. Mont Royal Ltd.**, 960 Jean Talon St. E., Montreal, Que., CA, $1,500,000. BASILICA, MONTREAL, QUE. Oratory St. Joseph's of Mount Royal, Montreal, Que. G. Moreau, 3776 Queen Mary Rd., Montreal, Que., archt.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

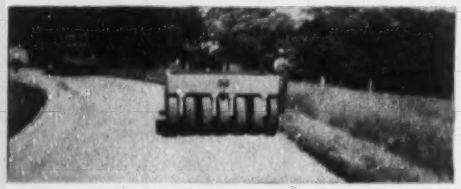
▲† **Mannix International Corp.**, 174 Lombard Ave., Winnipeg, Man., CA, $1,731,414. rail replaying, ballasting, etc. on 58.7 mi. railroad between Seward and Portage, ALASKA. The Alaska Railroad, Dpt. Interior, Anchorage, Alaska. CD 6/28, under LB.

(Proposal Advertisements see pp. 96 to 98)

BROS tip sheet

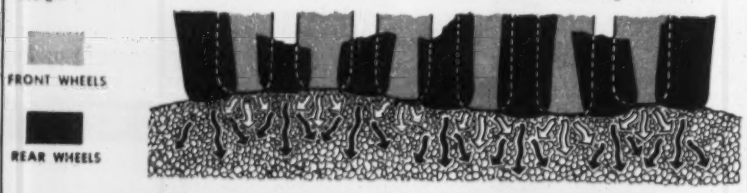
EQUIPMENT NEWS FROM A FAMOUS NAME IN ROAD MACHINERY

COSTLY EXTRA PASSES ELIMINATED WITH "WIDE TIRE" COMPACTION ROLLERS BY BROS



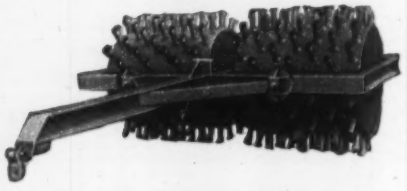
Look below and see how the world-famous Bros Wobble-Wheel design (patented and copyrighted) works. Added to the regular up-and-down oscillating motion is a side-to-side weaving, kneading motion of each wheel, that aids compaction. You can get Bros rollers with this design or oscillating Straight-Wheel design.

No more lines, ridges or marks! New Bros pneumatic tire rollers give you full coverage of every surface contour on *every pass!* Now you can use the same roller for seal-coat rolling as well as rough base compaction. New design of Bros kingpin makes drawbar hookups easier, at any height. Three models—7, 9 and 13-ton capacities.



CHOOSE A TAMPER THAT'S READY FOR ROUGH AND TOUGH COMPACTION WORK

A sheepfoot tamping roller is one thing you don't want to waste time on. Therefore, get tampers that are built to last, like the Bros medium-weight "M" series. These tampers have a heavy outer shell and integral steel axle connected by welded end plates. Self-aligning bearings. Frame is encircling box type, very strong. Specify the *toughest*—specify Bros!



Bros "M" Series sheepfoot tampers come in 1, 2 and 3 drum models. Choice of 5½ or 7 sq. in. foot surface areas. Ft. psi range from 108 lbs. to 315 lbs. Extra drawbar for tandem work.

"Quickies" for your information

Don't be caught with "orphan" compaction equipment. Remember that Bros is the world's largest manufacturer of pneumatic tire rollers.

●

Bros originated and patented the giant 50-ton rubber-tire Roll-O-Pactor, widely used on the big jobs.*

Giant-weight Bros "G" Series tamping rollers range in ft. psi from 260 to 738 lbs.

●

Bros also makes "special" types of tamper and smooth drum rollers, to order. Let us quote you.

Road Machinery Division, **WM. BROS BOILER & MFG. CO.**

1197 Tenth Avenue S. E. • Minneapolis 14, Minnesota

To get specifications and data on any of the Bros compaction products listed below, just check the items which interest you and send us this slip, along with your name, company or organization and address.

☐ Bros 35 and 50-ton Roll-O-Pactors*
☐ Special Airborne Roll-O-Pactors*
☐ Bros 7, 9 and 13-ton Pneumatic Tire Rollers
☐ Giant weight Bros "G" Series Tamping Rollers
☐ Medium weight Bros Series "M" Tamping Rollers
☐ Bros smooth drum rollers

UNIT PRICES

N. Y. subway-"el" connection

New York City Transit Authority awarded $393,409 trackwork to Tully & DiNapoli, Jamaica, N. Y., at 5% under the second bid. Ramp construction is already underway on the Liberty Ave. connection between the Fulton St. subway and Liberty Ave. elevated lines.

Five contractors vied for the job which must be completed in one year. Present wage rates include $1.74-$1.86 per hour for trackmen, $1.98 per hour for specialists. Rates will probably rise 10¢ before work begins.

Bidders include:

1C	Tully & DiNapoli, Jamaica 32, N. Y.	$393,409
2	Watson Flagg Eng. Co., New York, N. Y.	414,774
5	Wagner Larson Constr. Co., Bklyn., N. Y.	629,742

Bids, 7-2-54 Item	Unit	Quantity	Unit Prices 1C	2
1:2:4 conc masonry	cy	560	$30.00	$30.00
Rem exist bump posts	ea	2	140.00	130.00
Pipe hndrail, furnish	lf	3,500	3.00	3.50
install	lf	3,030	2.20	2.75
rem exist	lf	50	0.70	2.00
Slatting, install	lf	18,300	0.30	0.30
rem exist	lf	1,000	0.20	0.25
Wood ladders, rem exist	ea	1	13.00	30.00
furnish	ea	7	60.00	50.00
install	ea	5	40.00	40.00
Anticreeper, f & del 1 pc	ea	2,000	0.40	0.50
f & del 2 pc	ea	1,050	0.60	0.70
instl 1 pc	ea	2,000	0.20	0.20
instl 2 pc	ea	780	0.20	0.30
Cut out conc masonry	cf	10	15.00	15.00
CI hnd hold frams, covers & gratings, f&p compl	ton	5	700.00	700.00
Instl cl I track excl ballst:				
tang & crv over 3Mf rad	lf	1,350	4.90	5.50
curv 1,000'-2,300' rad	lf	590	7.50	7.00
curv under 500' radius	lf	630	8.00	9.00
Instl cl II track excl conc:				
tan & curv over 3,000' ra	lf	1,200	2.90	6.00
curv 1,000'-2,300' rad	lf	45	5.00	8.00
curv 500'-1,000' radius	lf	150	6.00	10.00
Reconstr superelev exist tr	lf	170	6.00	9.00
Instal cl III tr compl:				
tan & curv over 3,000'	lf	250	14.00	16.00
curv 1,000'-2,300 rad	lf	1,430	14.00	18.00
curv under 1,000'	lf	100	18.00	23.00
rem exist track	lf	1,000	4.00	4.00
Rem exist rails, track	lf	105	1.30	3.00
emergncy	lf	105	1.30	2.00
Instl tr rails, spec loc	lf	200	1.90	3.50
Instl cl VI tr, excl blist, curves 1,000'-2,300' rad	lf	240	6.70	8.00
Broken stone, blist, cl A	cy	1,170	6.50	10.00
Instl emerg rails	lf	2,400	1.20	1.40
Conduits, f&p 4" fibre	ft	100	11.50	2.50
2" metal	ft	290	3.30	3.00
Jt bars for 100-lb ARA cl B track rail, for cl "E"	ea	650	3.00	3.00
"F"	ea	410	3.50	3.20
"G"	ea	410	3.00	2.60
Malleable iron end-incl, f&d for guard rails	ea	47	16.00	19.00
Cut track spikes, f & del	cwt	180	11.00	11.00
Screw spikes, f&d cl A	cwt	53	13.50	15.00
E	cwt	55	16.00	18.00
Galv lag screws, ⅝" dia:				
4"	cwt	14	28.00	32.00
5"	cwt	2	25.00	29.00
Bolts, incl nuts:				
cl A	ea	45	3.50	3.80
C, w spring washer N	ea	1,320	1.00	1.25
E, w approv sp washer	ea	2,860	0.50	0.60
D, w washer U	ea	440	1.50	2.00
3¼" galv sheath, ½" dia, button hd, ⅝" dia	cwt	21	43.00	38.00
	cwt	100	16.50	20.00
G	cwt	36	18.00	21.00
H hook	cwt	105	26.00	30.00
Malleable iron rl braces	ea	940	2.00	2.00
Rolled stl tie plates, f&d:				
A	ea	3,800	0.70	0.70
B	ea	1,770	1.00	1.05
C	ea	350	1.00	1.15
D	ea	400	1.50	1.45
A-1	ea	485	1.00	1.00
B-1	ea	265	1.50	1.25
B-2	ea	210	1.50	1.50
C-1	ea	25	2.00	2.20

Bids: 7-2-54 Item	Unit	Quantity	Unit Prices 1C	2
C-2	ea	13	2.00	1.40
C-3	ea	25	1.00	1.25
E	ea	1,200	1.00	0.90
E-1	ea	160	2.00	1.55
E-2	ea	6	1.00	0.90
F	ea	60	2.00	1.80
G	ea	36	2.00	1.75
H	ea	27	2.00	2.20
Malleable iron tie pl, f&d:				
F-1	ea	12	4.00	3.40
F-2	ea	9	4.00	4.00
Appurt for 150-lb cont rl & prot board, f&d, for:				
end approaches	ea	27	100.00	95.00
side appr No. 6 w fitngs	ea	1	150.00	150.00
8 w fitngs	ea	8	150.00	165.00
anchors w fitngs, A	ea	8	100.00	95.00
F	ea	16	100.00	75.00
insulators	ea	1,100	3.00	3.30
painted MI ins caps	ea	1,100	1.00	0.80
cups	ea	1,100	0.50	0.20
galv stl prot bd bracket	ea	1,170	2.50	2.65
splice plates	ea	660	2.00	1.80
expans jts w fittings	ea	10	150.00	112.00
CI "B" separators, f&d:	ea	1,300	2.00	2.00
Mal iron washers f&d M-A	ea	1,300	0.50	0.40
M-B	ea	1,300	0.50	0.36
Plain stl washers T	100	125	6.00	5.60
Mal iron tie pl, R-1 to R-10 inc, f&d	cwt	53	20.00	24.00
Timber lag screws ¾" dia	cwt	15	20.00	21.00
Treated drilled yellow pine ties 6"x10", f&d:				
2'6", A	ea	1,030	5.00	5.75
2'6" B	ea	145	5.00	5.75
3'10½" C	ea	145	7.00	8.40
2'6" D	ea	4	5.00	6.15
3' E	ea	80	5.00	6.35
4'4½" F	ea	12	9.00	10.60
3' G	ea	24	5.00	5.95
2'8" H	ea	8	5.00	6.25
2'8" J	ea	48	6.00	6.75
3'10½" V	ea	15	7.00	8.95
2'8" W	ea	35	6.00	6.55
2'6" X	ea	13	5.00	6.40
2'8" Z	ea	4	6.00	7.25
Rem & instl 3'10½" contact rl ties, treat & undrill	ea	12	20.00	50.00
Treated 6"x8" undr yp ties:				
8'	ea	1,200	9.00	10.45
8'6"	ea	3	11.00	11.75
9'	ea	360	11.00	11.75
9'6"	ea	5	12.00	13.00
10'	ea	5	12.00	13.00
10'6"	ea	2	13.00	14.35
11'	ea	6	13.00	14.35
11'6"	ea	3	14.00	15.70
12'	ea	4	14.00	15.70
12'6"	ea	4	15.00	17.00
13'6"	ea	2	16.00	18.20
14'	ea	5	16.00	18.20
15'	ea	3	17.00	19.50
15'6"	ea	3	18.00	21.00
3'10½"	ea	12	6.00	5.20
Treated 8"x8" yp ties 9'	ea	3	14.00	15.00
9'3"	ea	2	15.00	17.00
Yp prot bd, f&d	lf	10,500	0.60	0.50
Untreated ties & tim, f&d:				
6"x8" ties & joists	Mfbm	110	240.00	255.00
6"x6" guard timbers	Mfbm	19	240.00	292.00
2"x6" slatting	Mfbm	22	240.00	300.00
beveled blocks	Mfbm	15	300.00	330.00
Renew ties in exist III tr:				
rem exist ties	tie	15	40.00	40.00
instl tie in exist tr	tie	15	50.00	55.00
Shift exist cont rl ties in III track	tie	140	40.00	22.00
Instl ties in exist III tr	tie	80	50.00	28.00
Special work, f & d	ls	.....	38,000	39,600
instl	ls	.....	40,500	42,300
Instl 150-lb contact rl	lf	8,900	0.65	1.00
Rem exist cont rl & appurt	lf	2,780	0.50	0.60
Reloc exist c rl & appurt	lf	900	1.00	1.60
Instl c rl prot board	lf	9,800	0.70	1.00
150-lb c rl jts incl mat	jt	260	70.00	50.00
Copper bonds & bolts, f&d	jt	22	8.00	10.00
Instl c rl expans joints	jt	10	70.00	60.00
end approach	ea	25	25.00	25.00
side approach 6	ea	1	50.00	50.00
8	ea	8	60.00	60.00
Instl contact rl anchor, A	ea	8	70.00	60.00
F	ea	13	80.00	60.00
F&p ins trk rl jts, A	ea	39	50.00	45.00
B	ea	11	90.00	90.00
C	ea	6	80.00	80.00
E	ea	7	90.00	90.00
Rem exist ins trk rl jts	ea	5	90.00	40.00
F&p ins trk rl in exist rl	ea	5	100.00	120.00
DC conns, c rl exp jt jmp	ea	3	1,200	700.00
6-cbl c rl, elev	ea	7	1,800	1,400
3 fs box & c rl clamp	ls	.....	800.00	1,056
Neg tr rl bonding, f&p:				
L, weld	ea	225	7.00	8.00
L, 36"	ea	42	8.00	9.00
L, 48" weld	ea	24	9.00	11.00
D, compress equalizer	ea	35	30.00	10.00
neg cable transposition	ea	2	430.00	150.00
Signal work	ls	.....	5,500	8,000

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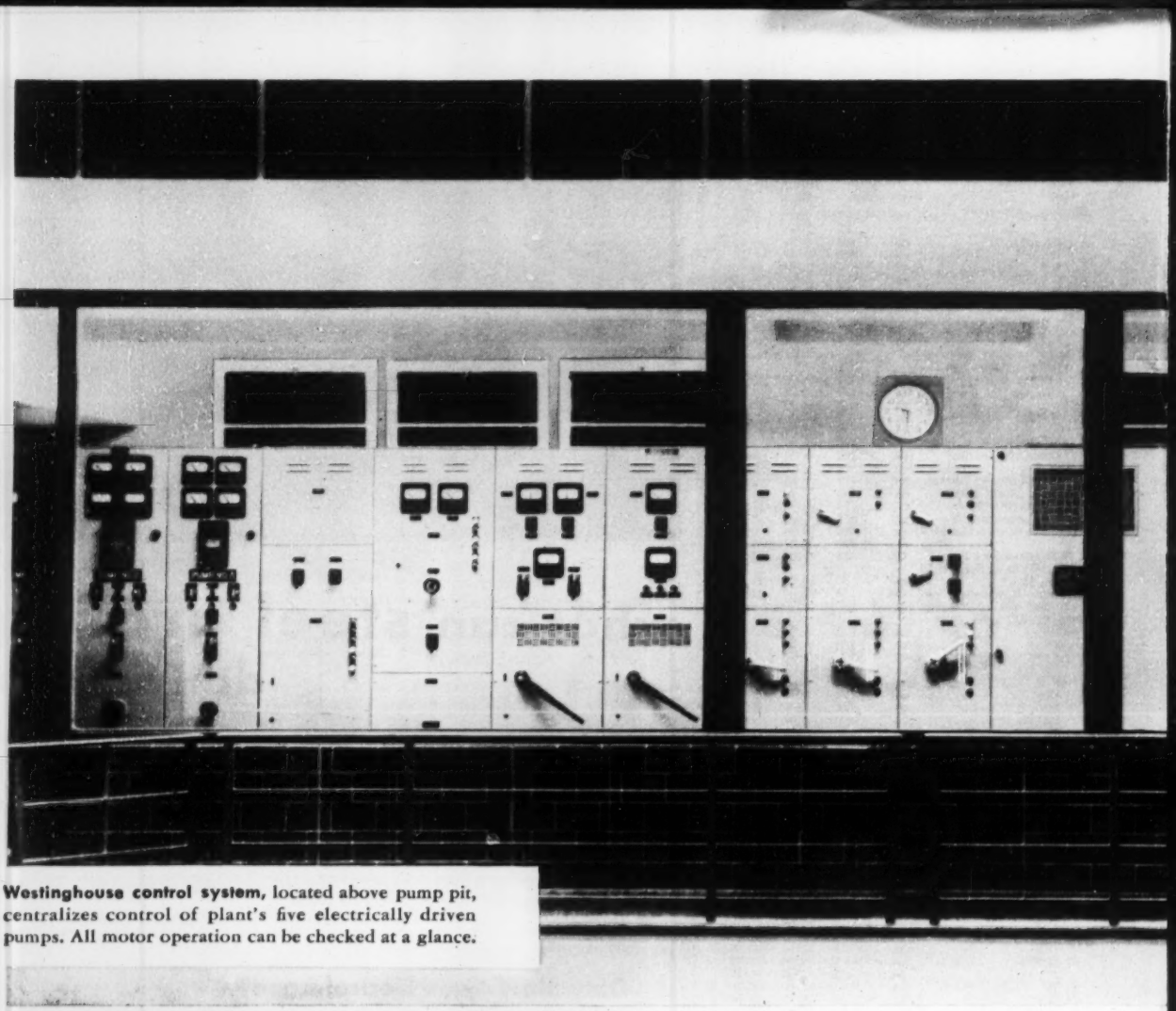
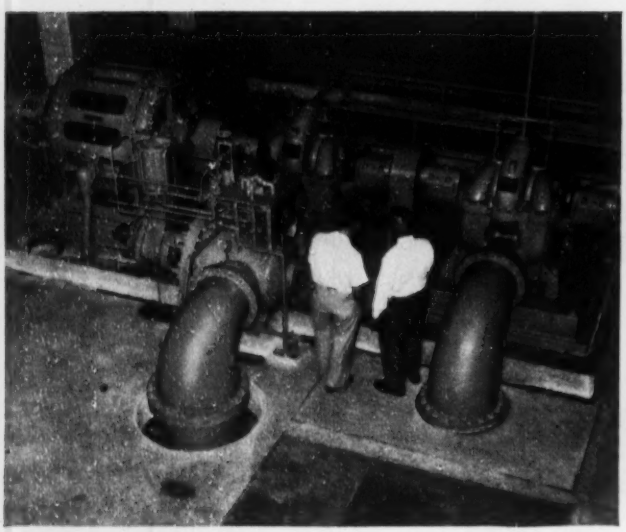
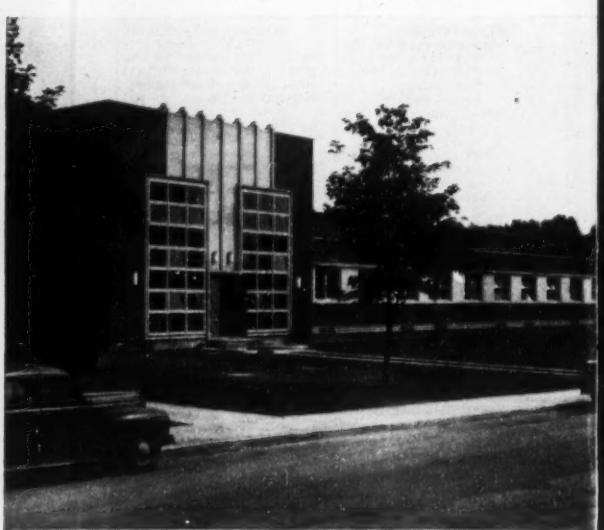


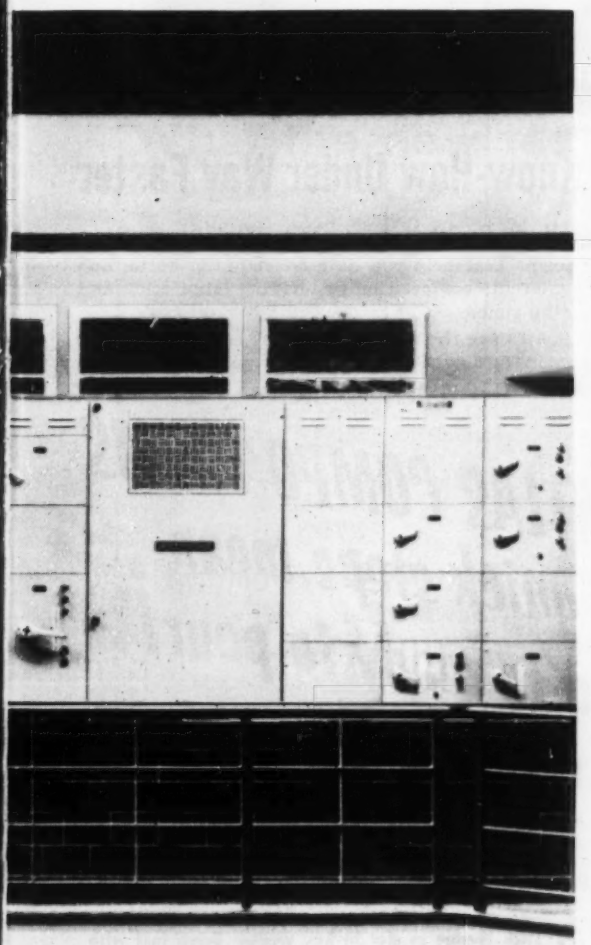
Westinghouse control system, located above pump pit, centralizes control of plant's five electrically driven pumps. All motor operation can be checked at a glance.

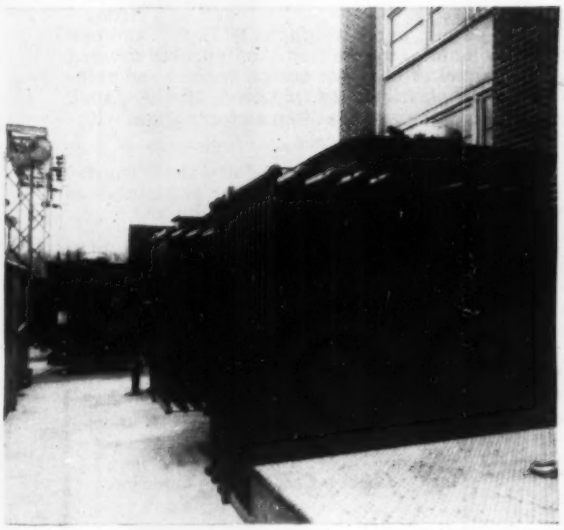


Westinghouse synchronous motor (2400 volts, 900 horsepower) operates one of the three 15-mgd electrically driven pumps at the three-million-dollar plant.



New 20-mgd filtration plant, Allentown, Pa. Consulting Engrs., Morris Knowles, Inc.; Electrical Contractor, Dravo Company—both of Pittsburgh, Pennsylvania.





Westinghouse power transformers (12,000 to 2400 volts) furnish the filtration plant's entire power supply. Left background: part of Westinghouse outdoor substation.

Allentown's outstanding filter plant has a centralized pump control system

The new 20-mgd filtration plant at Allentown, Pa., has stimulated considerable interest throughout the waterworks field. This outstanding installation doubles the available water supply and is expected to meet the city's needs for the next 30 years.

From planning stages through installation of equipment, Westinghouse teams worked closely with the consulting engineers. They helped design the electrical system. They matched it with coordinated products that met the plant's rigid requirements for attractiveness, efficiency and simplified maintenance.

How well these were carried out is reflected in the Westinghouse pump control system. Its many switching and control units blend in height and appearance due to their modular construction. Efficiency is assured since the system centralized in one location operation of the plant's pumps. And maintenance is simplified. By being mounted in one line, all units are easily accessible from the front of the board.

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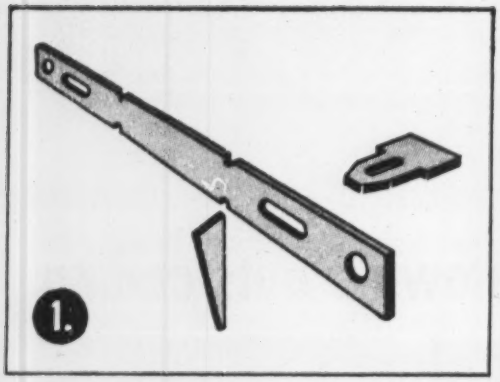

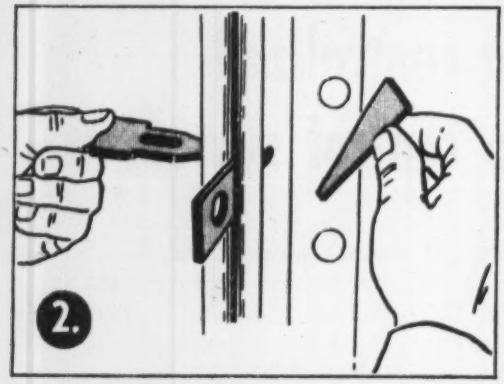

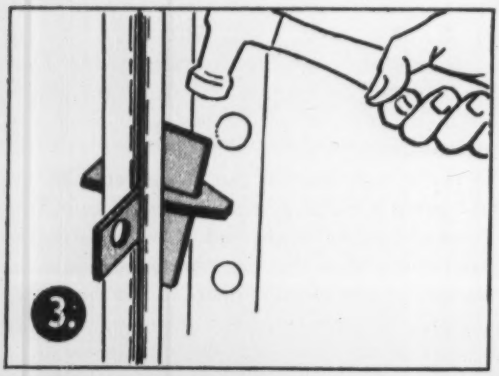

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What the new tax law means to depreciation

It can make big changes in your policies on buying, renting, and depreciating construction equipment

Joseph J. Schwartz
Attorney & C.P.A.
Schwartz & Meyers
New York City

The new depreciation rules being enacted by Congress as part of the revised income-tax law can bring drastic changes in contractors' policies on renting, buying, and depreciating equipment.

The new law makes it imperative for contractors to re-examine such policies very carefully.

Just what does the new tax law do about depreciation? To put things briefly, it permits contractors to double their present depreciation rates on new equipment for the first year.

The effects of this change are startling in several ways: It may no longer be good business to rent equipment, may be better policy to buy new equipment and replace it annually.

• Renting vs annual replacement

Let's take a hypothetical case. Suppose you need a tractor which costs $15,000. You could either: (1) rent it; (2) buy it and keep it for its useful life; or (3) buy it and replace it with a new tractor each year.

Suppose we assume that annual rental on this tractor is $7,500, and that its useful life is five years. We will also assume that the corporate tax rate over the next five years is 50%: It is now 52%, of course, but it could go lower. And at any rate, if we assume a 50% tax rate the arithmetic of this hypothetical case is easier to grasp.

To rent a $15,000 tractor for five years at an annual rental of $7,500 would cost you $18,750 after taxes. To buy it and keep it for its useful life might cost you $13,125. But to buy a $15,000 tractor and replace it each year could cost you only $3,750 after taxes—an enormous saving. Now let us see how this example could work out.

• **Declining balance method**—The new law allows you to adopt a declining balance method of depreciation at rates double those permitted under the straight-line method. This provision applies, however, only to new property first put into use after Dec. 31, 1953.

First, you determine the rate of depreciation of the asset under the straight-line method. But instead of applying that rate each year to the full cost of the asset, you double it and apply the double rate each year to the balance of cost which is left after subtracting depreciation already taken.

For example, if in 1954 you purchase a $15,000 tractor with a useful life of five years and no salvage value at the end of that period, your depreciation allowance for each of the five years of its life will be:

Year	Under the Straight-Line Method	Under the New Method
1	$3000.	$6000.
2	3000.	3600.
3	3000.	2160.
4	3000.	1296.
5	3000.	777.60

Thus the effect of the new method is to start off with the highest deduction in the first year of useful life and taper off to very low deductions in the last years. It is interesting to note that in the case of a short-lived asset such as a pneumatic riveting hammer with a three-year life, you can take a depreciation allowance of 66⅔% of cost in the first year under the new method as against 33⅓% under the straight-line method. In the case of an asset with a long life, say 25 years, the new method recovers half its cost in nine years whereas the straight-line method takes 12½ years. In general, the new method depreciates 40% of the cost of an asset in the first quarter of its life and two-thirds of the cost in the first half.

• **Purchase**—Coming back to the $15,000 tractor: If your company is in the 50% tax bracket, the $6,000 deduction in the first year, under the new method, will save you $3,000 in taxes. **Therefore if you sell or trade-in the tractor for $12,000 at the end of the first year, and with the $3,000 saved purchase a new one, you have a new tractor without any additional outlay of capital. You may then take a $6,000 deduction once more in the second year and repeat the process.** Your only cost will be a capital gains tax of $750 each year on the excess of the trade-in value, $12,000, over the adjusted basis of the tractor, $9,000. For a five-year period the total after-tax cost to you will be $3,750.

If on the other hand you were to keep the tractor for its five-year life, the depreciation deductions will total $15,000. The expense of major repairs and overhauling (in addition to field repairs) might average about 15% per year, or $11,250 for the five years, for a total of $26,250 in deductions. With your company in the 50% tax bracket, the total after-tax cost to you would thus amount to $13,125.

Finally, if you were to rent the tractor for $7,500 a year, the total five-year rental will amount to $37,500, or an after-tax cost of $18,750.

It thus becomes possible under the new law to replace the $15,000 tractor annually at a net cost of $750, or 5% of its original cost per year. The following table illustrates the annual cost of replacing assets which have other useful lives.

Useful Life of the Asset	The Cost to Replace It Annually (Percentage of Original Cost)
3 yrs	8.33 %
4 yrs	6.25 %
5 yrs	5 %
6 yrs	4.167 %
8 yrs	3.125 %
10 yrs	2.5 %
12 yrs	2.083 %
15 yrs	1.667 %
20 yrs	1.25 %
25 yrs	1 %
30 yrs	0.83 %

Thus an asset which costs $15,000 and has a 10-year life may be replaced annually at a cost of 2.5% of $15,000, or $375 per year, and one costing $15,000 with a 20-year life may be replaced annually at a cost of $187.50 per year.

• **Resale assumption**—**All this, of course, assumes that the resale or trade-in value of the equipment at the end of its first year will equal its depreciated value on the straight-line basis.** In the case of the $15,000 tractor, the assumption is that resale value at the end of the first year would be $12,000.

If the resale value turns out to be lower, the cost of replacing it will of course increase. **However, there would have to be a sharp decline in resale value before total replacement**

(*Continued on page 92*)

costs for five years, after taxes, became greater than the after-tax cost of buying and keeping the same tractor for its useful life.

For example, if the resale value of the $15,000 tractor should be $11,000 after one year instead of $12,000, it will cost you an additional $1,000 to replace the tractor. But at the same time your capital gains tax will decrease from $750 to $500. Therefore the annual replacement cost becomes $1,500 when the tractor's resale value at the end of the year is $11,000.

Here are the annual replacement costs of the tractor with other resale values:

If the trade-in or resale value at the end of the year is	The annual replacement cost will be	And the total replacement costs for a 5-year period will be
$12,000	$ 750	$ 3,750
11,000	1,500	7,500
10,000	2,250	11,250
9,000	3,000	15,000

There are sometimes good practical reasons why a small contractor should rent rather than buy heavy equipment for a particular job. If no projects are likely to develop after that job is finished, in which the piece of equipment could be used again, it might be preferable to rent—even if the rental cost will total nearly as much as the purchase price.

For one thing, the rental is unquestionably a deductible expense for income-tax purposes. Furthermore, the extra investment necessary to buy the equipment might be lost, either because the machine has little resale value or because it will be obsolete before it can be used again. Besides, if a contractor purchases a piece of equipment that is used on only one job, it may be hard to convince the Internal Revenue Service that its entire cost should be charged to that job, when the machine is apparently still in good condition.

• Other methods

In comparing the straight-line method with the declining balance method, there is one more fact that should be kept in mind. The straight-line method insures the full recovery of cost by the end of an asset's useful life. But the declining balance method leaves an unrecovered portion of some 8% to 13%. Thus, if you plan to keep an asset for its entire life, the declining balance method is less attractive.

To deal with this, the new tax law allows taxpayers to switch from declining balance to straight-line at any time in the life of an asset. The straight-line rate would then be based on the remaining life of the property applied to the depreciated balance of the asset at the time when the switch was made.

• **Sum-of-the-years'-digits** — The new law offers still another solution to the problem of unrecovered cost. It gives taxpayers the option of using the sum-of-the-years'-digits method. This allows a taxpayer to get essentially the same results as the declining balance method, while insuring the full recovery of costs by the end of an asset's useful life.

Here's how this works: If a piece of equipment has a five-year life, the rate of depreciation for the first year will be 5/15. The numerator of this fraction is the remaining useful life of the equipment, and the denominator is the sum of the years' digits for the original useful life of the equipment. In this case, it is 1 plus 2 plus 3 plus 4 plus 5, or 15. In the second year of the life of an asset whose original useful life is five years, the rate of depreciation is 4/15, in the third year 3/15, and so on.

Thus, using our example of a $15,000 tractor with a useful life of five years and no salvage value, here is a comparison of the depreciation allowances for each of the five years under the three methods:

Year	Straight-Line Method	Declining Balance Method	Sum-of-the-years' Digits Method
1	$3000.	$6000.	$5000.
2	3000.	3600.	4000.
3	3000.	2160.	3000.
4	3000.	1296.	2000.
5	3000.	777.60	1000.
Total	$1500.	$13833.60	$15000.

One final word before leaving the subject of depreciation methods: The tax laws have never required that any particular method of measuring depreciation be used. They demand only that the allowance for exhaustion, wear and tear, and obsolescence of assets be reasonable.

• Determining "useful life" of equipment

Next to picking a method of depreciation, the element that causes most trouble in measuring depreciation is determining an asset's useful life. This is always a bone of contention between taxpayers and the Internal Revenue Service, the taxpayers tending to use a short life in order to increase rate of depreciation and IRS taking the opposite tack.

In determining the useful life of a piece of equipment, these are the principal factors that should be considered: physical life of the equipment, its rate of obsolescence, and the maintenance policy of your company.

Some other factors that may also have a bearing on useful life are the climatic conditions under which the equipment will be used, the type of labor or personnel who will be operating it, the kind of raw material upon which it is intended to be used, and the number of shifts under normal operating conditions.

• **The first step**—The first step therefore is to estimate how long the equipment will be used in your business under normal conditions. Such an estimate must be largely a matter of opinion based upon the already-mentioned factors as well as an expert knowledge of your particular business operations.

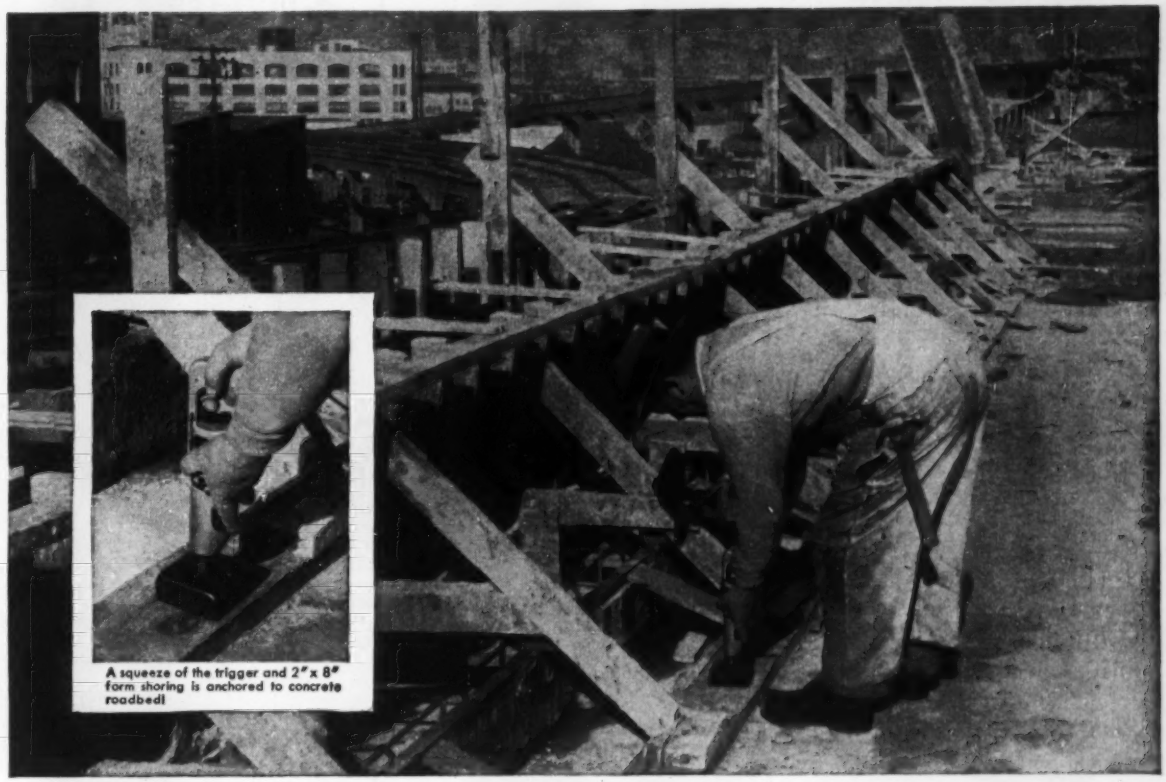
As a starter, you might check Bulletin F issued by the Treasury Department. This bulletin contains schedules listing the estimated useful lives and rates of depreciation of properties in various industries under so-called average conditions. These estimated rates are by no means controlling on the taxpayer, but they may be useful basic rates to which you can apply the specific factors in your business which will have an influence on the useful life of your equipment.

• **Maintenance policy**—Your maintenance policy is another factor in determining useful life. Equipment will have a shorter life if you are unable to afford an adequate maintenance policy which may require periodic shutdowns, sufficient repairmen, inventories of spare parts and so on. The rates of depreciation in Bulletin F contemplate a reasonable expense policy for maintenance in order to keep the property in fair operating condition.

If your business conditions are such that more or less than average maintenance will be incurred, your depreciation rates should be accordingly adjusted.

• **Expert opinion—From a practical viewpoint, however, determining the number of years of useful life of your equipment and the effect of such factors as obsolescence and maintenance policy on its physical life are matters of expert opinion.** Few taxpayers are qualified by experience to form a reliable opinion of the time when the usefulness of their equipment will be

(*Continued on page 94*)



A squeeze of the trigger and 2" x 8" form shoring is anchored to concrete roadbed!

REMINGTON STUD DRIVER speeds fastening job on West Coast Highway

TEMPORARY ANCHORING OF FORMS TO CONCRETE can be time-consuming and costly—but it wasn't that way on the new San Francisco Freeway. Here, the Remington Stud Driver did the job in record time by setting up to 5 fastening studs per minute!

The forms were used for pouring the Freeway's railings and curbings after the concrete roadbed had set. A workman simply moved down the base strip with the Stud Driver, and it was securely fastened! When the curbing was in, the forms were removed and the studs broken off below the concrete surface. The small craters that remained were smoothed over with grout.

SAVINGS UP TO 80% IN FASTENING COSTS ARE NOT UNCOMMON with the Remington Stud Driver. Its speed, light weight (6 lbs.), and freedom from wires and hose make it ideal for all kinds of construction fastening. Find out how *you* can save with this powder-actuated tool by mailing the coupon below.

"If It's Remington—It's Right!"

Remington DUPONT

Listed & Approved by Underwriters' Laboratories, Inc.

QUESTIONS YOU ARE ASKING

QUESTION: What caliber cartridge powers the Stud Driver?

ANSWER: 32 caliber power loads are available in six grades, each designed for your specific fastening requirements.

MAIL THIS COUPON TODAY

Industrial Sales Division, Dept. E.N.R. -7
Remington Arms Company, Inc.
Bridgeport 2, Connecticut

Please send me a *free* copy of the new booklet showing how I can cut my fastening costs.

*Name*_____

*Position*_____

*Firm*_____

*Address*_____

*City*_____ *State*_____

exhausted through wear and tear, decay, and obsolescence. Most taxpayers therefore either adopt the estimate of Bulletin F or accept their accountant's estimate.

But if the amount of equipment owned by your company is great enough so that the depreciation allowance is an important expense, it might be preferable to employ competent appraisal engineers to determine the useful lives of your equipment in the light of the various conditions which exist in your own business operations. The cost of doing this is often outweighed by the fact that the calculations of competent appraisal engineers are preferred by IRS to the guess work of unqualified taxpayers, with resultant savings in the cost of disallowances and in tax litigation.

An alternative method used by many construction companies is to adopt estimates of useful life and depreciation published by contractors' associations. The Associated General Contractors of America Inc., for example, publishes detailed lists of the various kinds of equipment used by construction companies, together with the average useful life and rate of depreciation for each. These rates are based on the experience of many construction companies taken over a long period of time.

• **Accelerated depreciation**—In discussing useful life, a final word should be said about accelerated depreciation. It is well known that a contractor's equipment is subject to hard usage and unusual wear and tear. For one thing, second-hand equipment is often used. For another, the necessity of continuous work, lack of proper maintenance, and exposure to the elements tend to limit the useful life of a contractor's equipment. IRS recognizes this and under certain conditions permits contractors to accelerate the rates of depreciation of their equipment.

Accelerated depreciation may thus be permitted because of such factors as: overtime operation of equipment, inexperienced operators, adverse climatic conditions, and the use of equipment upon work for which the equipment was not designed. Where such conditions exist, IRS may allow accelerated depreciation.

But note that accelerated depreciation will not be allowed unless it can be shown that maintenance did not compensate for the increased use and arrest the accelerated depreciation. For mere proof of abnormal use of the equipment will not entitle you to an increased allowance. It must be shown that the abnormal use of the equipment specifically shortened its useful life.

• **Keeping records—It should be apparent that adequate records must be kept in order to obtain the maximum depreciation allowance. Despite all that has been said about depreciation methods, the use of these methods may fail to help you get the full deduction if your depreciation records are incomplete.** You should keep an adequate card index or other system in which you record the data that enters into the computation of the depreciation for every piece of equipment you own, for your records must substantiate the depreciation deductions on your company's tax return.

Your records should show the date, source, and price paid for each piece of equipment, a description of each addition or improvement to it, with the date and cost thereof, and similar data for each piece of equipment retired or sold. If these records are properly kept, much of your trouble with IRS over depreciation will tend to disappear.

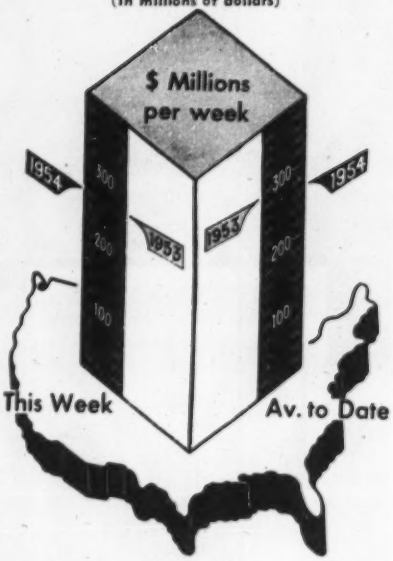
• Conclusion

There is obviously a real advantage from a dollars-and-cents viewpoint in getting a greater depreciation deduction in the early years of an asset's life. Although the total deductions over the life of the asset may be the same regardless of what method is used, most businessmen prefer taking a deduction now rather than later—because the tax-saved money can be used now. This is particularly true in the construction industry, for the construction industry is dependent on current earnings and short-term loans to obtain funds for investment in equipment and for expansion. Therefore a faster recovery of capital invested in equipment will increase your working capital and will permit you to secure short-term loans which would otherwise not be available.

However, a final word of caution may be in order. Each business is a combination of many factors which make it a unique entity. While tax saving is of utmost importance, present tax considerations should never be permitted to override the intelligent use of established economic, cost and accounting principles. In spite of the current tax liberalization rules, therefore, you must always determine the depreciation methods most beneficial to you and apply them in the light of all the conditions, tax and otherwise, particularly applicable to your company.

Activity This Week

As reported to ENR
(In millions of dollars)



Amount of contracts let

Millions of dollars

	This Week	Cumulative 30 wks 1954	1953	% chge
Federal	$18.4	$740.6	$949.8	−22
State and municipal	100.7	2,773.1	2,850.4	−3
Total public	119.1	3,513.7	3,800.2	−8
Total private	143.2	4,565.0	5,071.0	−10
U. S. total	$262.3	$8,078.7	$8,871.2	−9

Contracts by type of work

Waterworks	$2.4	$127.4	$139.2	−8
Sewerage	9.4	223.1	229.2	−3
Bridges	11.0	267.9	353.2	−24
Highways	52.2	1,035.6	1,044.3	−1
Earthwork, Waterways	3.1	164.9	245.3	−33
Buildings:				
Public, excl. hsg.	34.4	1,038.2	1,003.2	+3
Housg., pub.	2.1	141.2	282.4	−50
Housg., priv.	110.4	2,558.6	2,255.8	+13
Commercial	9.6	720.5	658.1	+9
Industrial	13.0	1,051.9	1,582.3	−34
Unclassified	14.7	749.4	1,078.2	−30
Total	$262.3	$8,078.7	$8,871.2	−9

NOTE: Minimum size projects included are: Waterworks and waterways, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

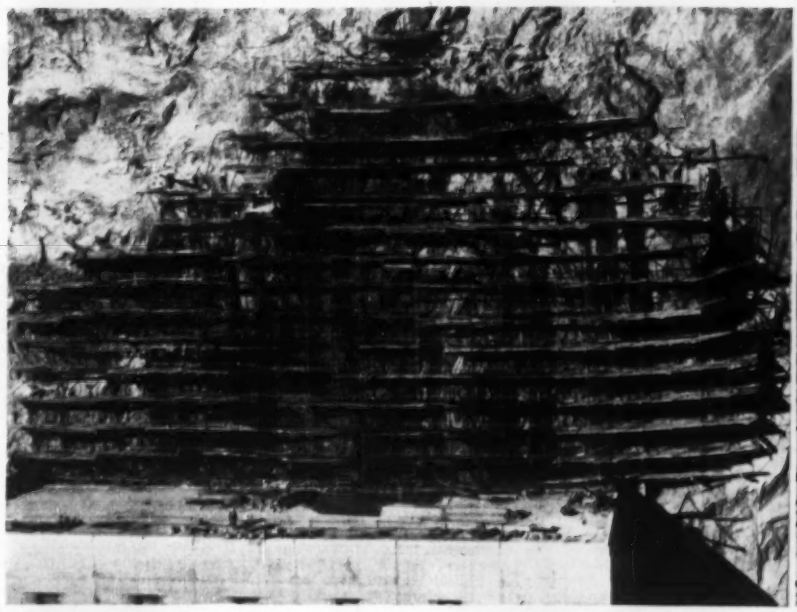
Millions of dollars

	Week of July 22 1954	Cumulative 29 Wks 1954	% chge '53-'54
Corporate securities	$161.1	$1,852.9	−27
State and municipal:			
All except housing	37.5	3,268.0	+33
Housing	...	69.7	−67
Federal loans	0.2	73.9	+6
Federal aid	575.0	630.0	...
Total non-federal	$773.7	$5,894.5	+12
Federal approps.:			
In U. S.	$1,070.0	$1,126.0	...
Outside U. S.	23.8	28.4	...
Total new capital	$1,867.5	$7,048.9	+33

ENR cost and volume indexes, 1954

		Base years = 100 1913	1926	1949
Construction cost	7/22	642.38	308.79	134.67
	7/15	644.06	309.60	135.02
Building cost	7/22	455.99	246.49	129.62
	7/15	457.59	247.40	130.08
Volume	June	510	207	147
	May	648	263	187

For additional cost index data, see Construction Daily



SPECTACULAR SCAFFOLDING—To safely anchor a huge rock slab, overhanging the Nevada valve house at Hoover Dam, Boulder City, Nev., men of Selby Drilling Co. worked from this immense "TubeLox" Steel Scaffold erected along the sheer canyon wall. "TubeLox" was used because it could be cantilevered inward, conforming to the contour of the massive 180 x 120 x 19 ft. slab. Safe support for the fourteen 7'6"-high platforms for drillers required an assembly using 11,000 lineal ft. of "TubeLox." Right: Men place one of the 349 2-in. dia. anchor bars, used to secure the slab to the canyon wall.

FOR GREATER SAFETY . . . EFFICIENCY . . . ECONOMY

THE PATENT SCAFFOLDING CO., INC.

38-21 12th St., Dept. ENR — Long Island City 1, N. Y.

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Branches in all principal cities

To help you solve any scaffolding problem PS offers a complete nation-wide engineering service—available locally. See the Yellow Pages in your 'phone book for the nearest Patent Scaffolding office or representative handling "Gold Medal" Scaffolds.

Simplifies Concrete Cutting

FELKER DI-MET

MODEL 200

MORE MANEUVERABILITY...

LESS WEIGHT...

POWER FOR BIG JOBS OR SMALL!

This NEW Felker DI-MET CONCRETE CUTTER meets *all* cutting requirements at LOW COST! Takes deep cuts and covers the footage of *big* machines, yet handles as easy as a baby buggy. Light weight means more maneuverability on close-ups, easier loading for fast transportation. Holds straight and true on long stretches. Uses economical 10" or 12" blade sizes. Cuts up to 3¾" deep with 12" blade. 13.5 h.p. Wisconsin engine provides ample power *even for 14" blades* and deeper cuts (by equipping with special blade guard). Hydraulic lift raises blade from cut, velvet-smooth hydraulic retardant eases blade into concrete—saves wear, increases blade life.

ADD ACCESSORIES AS YOU NEED THEM!

This new DI-MET Model 200 is available as a BASIC UNIT or may be purchased with additional accessories. POWER DRIVE and COOLANT PUMP ASSEMBLIES can be field installed. STARTER, GENERATOR and BATTERY must be ordered with the ENGINE. Choose what you *need*, buy what you *want!*

Many other exclusive features
—ask for circular!

CELEBRATING OUR 30th ANNIVERSARY · SINCE 1924 · FELKER DI-MET

FELKER MANUFACTURING CO.

TORRANCE • CALIFORNIA

World's Largest Manufacturer of Diamond Abrasive Cut-off Wheels and Machines

Made by the *only* manufacturer building both CONCRETE CUTTING MACHINES AND DIAMOND WHEELS . . . the winning combination that means *more* footage at *less* cost!

OFFICIAL PROPOSALS

Bids: August 18, 1954

Construction of Sewage Treatment Works

Notice is hereby given that sealed bids or proposals for furnishing all labor and materials for the construction of approximately 130,000 lineal feet of 8", 10", 12", 15" and 18" sanitary sewers, manholes, and miscellaneous appurtenances, and for the construction of a new Sewage Treatment Works, in the Borough of Morrisville, Bucks County, Pennsylvania, will be received by the Municipal Authority of the Borough of Morrisville, in the Council Chambers of the Borough Hall, Washington Street and Chambers Street, Morrisville, Bucks County, Pennsylvania, up to 2:00 o'clock P.M., Eastern Daylight Saving Time, Wednesday, August 18, 1954, at which time the proposals will be publicly opened and read aloud.

The sewer construction work will be divided into three contracts designated as:

CONTRACT NO. 1: Branch and Intercepting Sewers consisting of approximately 48,000 lineal feet of 8"-10"-12"-15"-16" and 18" Sanitary Sewers together with manholes and miscellaneous appurtenances.

CONTRACT NO. 2: Branch and Intercepting Sewers, consisting of approximately 39,000 lineal feet of 8"-10" and 12" Sanitary Sewers together with manholes and miscellaneous appurtenances.

CONTRACT NO. 3: Branch and Intercepting Sewers consisting of approximately 43,000 lineal feet of 8"-10" and 12" sanitary sewers together with manholes and miscellaneous appurtenances.

Bidders on Sewers may bid on individual contracts or on a combination of Contracts 1, 2 and 3.

The construction of the new Sewage Treatment Works will be divided into five contracts designated as:

CONTRACT NO. 4—STRUCTURAL WORK
CONTRACT NO. 5—MECHANICAL WORK
CONTRACT NO. 6—ELECTRICAL WORK
CONTRACT NO. 7—HEATING & VENTILATING WORK
CONTRACT NO. 8—PLUMBING WORK

Copies of the plans, specifications and other contract documents will be on file and open to public inspection after July 27, 1954 at the office of Albright & Friel Inc., Consulting Engineers, 121 South Broad Street, Philadelphia 7, Pennsylvania; and at the office of Robert H. Steward, Secretary of Borough Council, 635 N. Delmorr Avenue, Morrisville, Pennsylvania, and sets of the plans, specifications, and contract documents may be obtained during any business hour at the office of Albright & Friel Inc., upon paying a deposit of $30.00 for each set of documents for each of Contracts 1, 2 and 3; and $50.00 for each set of plans and specifications on the Sewage Treatment Works. If the documents are returned in good condition within five days after the opening of bids, the full amount of the deposit for one set of each contract will be returned to each actual bidder and other deposits will be refunded with a deduction of 50% of deposit for each set of each contract returned to defray the actual cost of reproduction. If the documents are not returned within the time stated, the entire amount of deposit will be forfeited. Deposit checks should be made payable to Albright & Friel Inc.

All bids should be addressed to Mr. Harris W. Voorhees, Secretary, Municipal Authority of the Borough of Morrisville, Morrisville, Pennsylvania, and shall be placed in a sealed envelope sufficiently labeled to indicate that it is a bid for this work.

A bid bond or certified check made payable to the Municipal Authority of the Borough of Morrisville in the amount of five (5) per cent of the bid must be deposited by each bidder with his bid as a guarantee that in case any contract is awarded to him, that he will execute the contract and furnish the bond required.

The Municipal Authority of the Borough of Morrisville hereby reserves the right to refuse and reject any or all bids; and the said Municipal Authority also reserves the right to waive any informalities in bids received.

No bid may be withdrawn by the bidder for forty-five (45) days after the scheduled closing time for the receipt of bids.

HARRIS W. VOORHEES
Secretary, Municipal Authority
of the Borough of Morrisville, Pa.

July 22, 1954

OFFICIAL PROPOSALS

Bids: August 12, 1954

Construction of Viaduct Substructure

DELAWARE RIVER PORT AUTHORITY
Administration Building
Camden, New Jersey
PHILADELPHIA VIADUCT
SUBSTRUCTURE
FROM PHILADELPHIA ANCHORAGE
TO SECOND STREET
CONTRACT NO. P-2

Sealed bids will be received for the construction of the Viaduct Substructure for the Philadelphia Approaches from the Philadelphia Anchorage to Second Street, new bridge, Philadelphia, Pennsylvania, to Gloucester, New Jersey, known as Contract No. P-2, at the office of the Executive Director of the Delaware River Port Authority, Administration Building, Bridge Plaza, Camden, New Jersey, until 2:00 P.M. (Eastern Daylight Time), August 12, 1954, at which place and time they will be publicly opened and read by the Authority.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of $10.00 which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty days after the opening of bids.

Each proposal must be accompanied by a certified check in the sum of $100,000 payable to the Delaware River Port Authority and drawn upon a National or State Bank or Trust Company having an office or place of business either in Philadelphia, Pennsylvania, or Camden, New Jersey, and must not be enclosed with the sealed bid. The surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a performance and Labor and Materialmen's Bond in the sum of 100 per cent.

The Authority will afford prospective bidders an opportunity to inspect the site of the work.

The Authority reserves the right to waive any informalities in the bids received; to reject any or all bids, and to award the contract only to those experienced in this class of work and to the bidder whose proposal is deemed by the Authority to be most advantageous to the public interest.

DELAWARE RIVER PORT AUTHORITY
JOSEPH K. COSTELLO
Executive Director

Bids: August 6, 1954

Contract No. 1410

WASHINGTON SUBURBAN SANITARY COMMISSION
FURNISHING AND DELIVERING
TRUCK MOUNTED REFUSE
COLLECTORS

Sealed proposals for furnishing and delivering two (2) complete truck mounted refuse collectors will be received in the office of the Acting Purchasing Agent, Room G-11, of the Washington Suburban Sanitary Commission, Hamilton Street, Hyattsville, Maryland until 10:30 A. M. Eastern Daylight Saving Time, on Friday, August 6th, 1954 at which time and place they will be publicly opened and read.

Specifications may be obtained from S. Z. Salsberry, Acting Purchasing Agent of the Commission, Hyattsville, Maryland.

Raymond W. Bellamy, Chairman
L. S. Ray
J. Norman Ager
Commissioners

ATTEST:
James B. Parkhill
Secretary-Treasurer

Bids: October 26, 1954

Construction of Jetty

NEW PLYMOUTH HARBOUR BOARD
NEW ZEALAND

Tenders will be received until 5 p.m. on 26th October, 1954 for the construction of Moturoa Jetty in reinforced concrete approximately 1,100 feet by 90 feet. Drawings and contract documents may be inspected at the New Zealand Government Trade Commissioner's Office, Dupont Circle Building, 1346 Connecticut Avenue, N. W., Washington 6, D. C., and may be obtained from the Consulting Engineer, Mr. W. G. Morrison, 28 Buller Street, Wellington, New Zealand.

OFFICIAL PROPOSALS

Bids: September 1, 1954

Construction of Pumping Stations

CITY OF ALEXANDRIA, VIRGINIA,
SANITATION AUTHORITY
PUMPING STATIONS

Sealed proposals will be received by the City of Alexandria, Virginia, Sanitation Authority at the office of the Authority, Room 201, 113 North St. Asaph Street, Alexandria, Virginia, until 2:00 P.M. Eastern Daylight Time, September 1, 1954, at which time they will be publicly opened and read aloud, and Contracts will be awarded as soon thereafter as practicable for the construction of sewage pumping stations in the City of Alexandria, Virginia.

The work is part of the Sewage Disposal Project and is to be performed under Division E. The bidders may submit a proposal for the complete Division, but not for any part of the Division.

Division E, Pumping Stations, comprises the construction of the River Road Pumping Station and the Four Mile Run Pumping Station. The work includes the substructures, superstructures, the furnishing and installation of the pumping equipment, electrical work, outside piping, grading and roadways. The River Road Pumping Station has an installed pumping capacity of 1.2 million gallons a day and the Four Mile Run Pumping Station has an installed pumping capacity of 18.0 million gallons a day.

The Instructions to Bidders, Proposal, Form of Bid Bond, Agreement, Specifications, Plans and Form of Performance Bond may be examined at the office of the City of Alexandria, Virginia, Sanitation Authority, 113 North St. Asaph Street, Alexandria, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after opening of proposals.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the City of Alexandria, Virginia, Sanitation Authority in the amount of five per cent (5%) of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The City of Alexandria, Virginia, Sanitation Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interest of the Authority after all bids have been examined and canvassed.

City of Alexandria, Virginia,
Sanitation Authority
(Signed) JAMES J. CORBALIS, JR.
Engineer-Director

Dated: July 21, 1954
Alexandria, Virginia

U. S. Government

St. Paul District, Corps of Engineers, U.S. Army, 1217 U.S. Post Office and Custom House, St. Paul 1, Minnesota—Sealed bids will be received at this office until 2:00 P.M., C.S.T., 12 August 1954, and then publicly opened for Little Willow River Diversion Channel, Aitkin Flood Diversion Project, Mississippi River, Near Aitkin, Minnesota.

Read the Official
Proposal Columns of
ENGINEERING NEWS-RECORD
This Week and Every Week

OFFICIAL PROPOSALS

Bids: September 1, 1954

Construction of Intercepting & Trunk Sewers

CITY OF ALEXANDRIA, VIRGINIA
SANITATION AUTHORITY
INTERCEPTING AND TRUNK SEWERS

Sealed proposals will be received by the City of Alexandria, Virginia, Sanitation Authority at the office of the Authority, Room 201, 113 North St. Asaph Street, Alexandria, Virginia, until 2:00 P.M., Eastern Daylight Time, SEP. 1, 1954, at which time they will be publicly opened and read aloud, and Contracts will be awarded as soon thereafter as practicable for the construction of intercepting and trunk sewers in the City of Alexandria, Virginia.

The work is part of the Sewage Disposal Project and is to be performed under the following Divisions. The bidders may submit a proposal for any Division, all Divisions, or any combination of Divisions, but not for any part of any Division.

Division A—Potomac Interceptor, comprises the construction of approximately 8,490 linear feet of 42 inch, 1,650 of 36 inch and 2,370 feet of 18 inch concrete pipe sewer together with all connecting sewers, special crossings, manholes, house connections, and other structures as shown, specified and directed.

Division B—Commonwealth Interceptor, comprises the construction of approximately 1,250 feet of 72 inch, 550 linear feet of 42 inch, 5,050 linear feet of 36 inch, 1,530 linear feet of 33 inch, 3,980 linear feet of 30 inch, 1,950 linear feet of 18 inch, 1,304 feet of 15 inch concrete pipe sewer, 4,620 linear feet of 24 inch reinforced concrete force main and 335 linear feet of 8 inch cast iron force main, together with all connecting sewers, inverted siphons, special crossings, manholes, and other structures as shown, specified and directed.

Division C—Holmes Run Trunk Sewer, Section I, comprises the construction of approximately 8,660 linear feet of 60 inch, and 6,930 linear feet of 54 inch concrete pipe sewer, together with all connecting sewers, inverted siphons, special crossings, manholes, diversion structures, metering stations, and other structures as shown, specified and directed.

Division D—Holmes Run Trunk Sewer, Section II, comprises the construction of approximately 6,200 linear feet of 36 inch 1,770 linear feet of 33 inch and 4,090 linear feet of 30 inch concrete pipe sewer, together with all connecting sewers, inverted siphons, special crossings, manholes, diversion structures, metering stations, and other structures as shown, specified and directed.

The Instructions to Bidders, Proposal, Agreement, Specifications, Plans and Form of Performance Bond may be examined at the office of the City of Alexandria, Virginia, Sanitation Authority, 113 North St. Asaph Street, Alexandria, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after opening of proposals.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the City of Alexandria, Virginia, Sanitation Authority in the amount of five per cent (5%) of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The City of Alexandria, Virginia, Sanitation Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interest of the Authority after all bids have been examined and canvassed.

City of Alexandria, Virginia,
Sanitation Authority
(Signed) James J. Corbalis, Jr.
Engineer-Director
Dated: JUL. 21, 1954
Alexandria, Virginia

CONTRACTORS
WATCH
THIS SECTION

for New Projects

Publish your announcements thru the "Proposal Section" of Engineering News-Record and get their bids.

OFFICIAL PROPOSALS

Bids: August 24, 1954

Contract LT-160.013

THE PORT OF NEW YORK AUTHORITY
LINCOLN TUNNEL
THIRD TUBE
ALERATIONS TO NEW JERSEY PLAZA
CONTRACT LT-160.013

Sealed proposals for alterations to the New Jersey Plaza of the Lincoln Tunnel will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, N. Y., until 2:30 p.m. on Tuesday, August 24, 1954, at which time said proposals will be opened and read in Room No. 1108.

Contract documents may be seen at the office of the Engineer of Materials of the Authority, Room 1112. Documents will be furnished upon deposit of $100.00 per set for not more than three sets to any one company (each set including one copy of the contract drawings). Additional sets will be furnished upon payment of $100.00 per set, which payment is not returnable. Deposits and payments shall be delivered to the Treasury Department, Room 719, where a receipt in duplicate will be issued. A copy of the receipt shall be delivered to Room 1112 where the documents will be furnished.

Those who have submitted a bid on the contract will receive a refund of the deposit for each set of documents, not exceeding three, returned within forty days after the opening of proposals. Those who have not submitted a bid will receive a refund of one-half of the deposit for each set of the documents, not exceeding three, returned within forty days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman
New York, July 29, 1954

Construction of the Dam and Appurtenant Works

GOVERNMENT OF IRAQ
MINISTRY OF DEVELOPMENT
BAGHDAD — IRAQ
Derbendi Khan Project
INFORMAL ANNOUNCEMENT

The Development Board of the Government of Iraq intends to issue a formal call for tenders this coming November for the construction of the dam and appurtenant works for the Derbendi Khan Project located on the Diyala-Sirwan River about 35 kilometers southwest of Halabja and some 230 kilometers northeast of Baghdad. The dam, a concrete gravity structure will have an estimated concrete volume of from 1,500,000 to 1,800,000 cubic meters and will involve some 650,000 to 800,000 cubic meters of all classes of excavation. Prospective tenderers may obtain more detailed information regarding the work upon application to the following:

(a) Directorate General of Contracts Development Board, Baghdad, Iraq.
(b) Harza Engineering Company 400 West Madison Street, Chicago, Illinois, USA.

The Development Board does not bind itself to issue the formal call for tenders mentioned herein and any response to this informal announcement must be undertaken without expense or obligation to the Board.

MINISTER OF DEVELOPMENT

OFFICIAL PROPOSALS

Bids: August 24, 1954

New Jersey Turnpike Authority

CONTRACT NO. N-8

Proposals are invited for Contract No. N-8 which involves the construction of the substructure and other incidental work for the Newark Viaduct in the City of Newark, Essex County, New Jersey, all in connection with the construction of the Newark Bay-Hudson County Extension of the New Jersey Turnpike.

The principal items of work include:
Open Foundation Excavation..... 19,500 Cu. Yds.
Untreated Timber Piles..245,000 Lin. Ft.
Concrete ..... 16,600 Cu. Yds.
Reinforcement Steel ....2,150,000 Lbs.

Proposals will be received at the New Jersey Turnpike Authority Administration Building, New Brunswick, New Jersey, until 11:00 O'Clock Eastern Daylight Saving Time on the morning of August 24, 1954, at which time and place said proposals will be publicly opened and read.

Bidders must submit with their proposal a Contractor's Financial and Equipment Statement.

Contract documents may be examined during office hours after July 29, 1954, at the office of the Authority and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, New York. Contract documents will be furnished upon payment of Fifteen Dollars ($15.00) for each set, upon application to the Authority. Contract documents are not required to be returned and the payment will not be refunded.

NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast, Chairman
July 22, 1954

Bids: August 9, 1954

Electric Driven Low Lift Pump and Appurtenances Des Moines, Iowa

Sealed bids will be received by the Board of Water Works Trustees, Dale L. Maffitt, Secretary and General Manager, at their office 1003 Locust Street, Des Moines 7, Iowa, up to 10:00 A.M. Monday, August 9, 1954, upon the following equipment and work:

Contract A—Vertical Electric Driven Pump 40 MGD at 38 ft. Head
Contract B—One 36" Cone Valve
Contract C—Electric Wiring and Appurtenant Work

Plans and specifications may be obtained from the office of the Des Moines Water Works, 1003 Locust Street, Des Moines, Iowa and at the office of the Engineers, Alvord, Burdick & Howson, 20 North Wacker Drive, Chicago 6, Illinois.

Plan Deposit—$10.00
Certified Check—5%

U. S. Government

GOV. OF DIST. OF COL., DIR. OF HIGHWAYS, D. C., July 14, 1954. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave. N.W., Wash. 1, D. C., until 2 PM, DST, Aug. 11, 1954, and then publicly opened and read for GRADING, DRAINAGE, STRUCTURES, PAVING AND TRUNK SEWER, 35TH ST. to STODDERT PL. ON E. CAP. ST. EXTENSION, CONTRACT NO. 5, Federal Aid F-42 (8) consist. of 213,000 cu. yds. excavation, 6,100 lin. ft. stormsewers, 3,700 lin. ft. sanitary sewers, 5,545 lin. ft. conc. curb, 2,190 lin. ft. conc. curb and gutter, 14,100 sq. yds. 8" reinf. conc. pavement, 11,625 cu. yds. conc. in bridge structures, 6,980 cu. yds. conc. in trunk sewer, 315,000 lbs. struct. steel, 3,000 lin. ft. handrail, and 2,250,000 lbs. reinforc. steel. Proposal forms, specns. and plans obtainable, upon deposit of a Certified Check for each set in the amount of $50.00, payable to Collector of Taxes, D. C., from Supervisor, Contr. & Bond Sec., Procurement Office, D. C., Rm. 406, 499 Pa. Ave., N.W. (Tel. NA 8-6000, Ext. 2378).

OFFICIAL PROPOSALS

Bids: September 29, 1954

Construction of Sewage Treatment Plant

CITY OF ALEXANDRIA, VIRGINIA,
SANITATION AUTHORITY
SEWAGE TREATMENT PLANT

Sealed proposals will be received by the City of Alexandria, Virginia, Sanitation Authority at the office of the Authority, Room 201, 113 North St. Asaph Street, Alexandria, Virginia, until 2:00 P.M. Eastern Daylight Time, September 1, 1954, at which time they will be publicly opened and read aloud, and Contracts will be awarded as soon thereafter as practicable for the construction of a sewage treatment plant in the City of Alexandria, Virginia.

The work is part of the Sewage Disposal Project and is to be performed under the following Divisions. The bidders may submit a proposal for any Division, all Divisions, or any combination of Divisions, but not for any part of any Division.

Division I—General, comprises the construction of the treatment plant buildings, tanks and structures, including pile foundations, the furnishing and installation of piping and equipment, except for pumping and filtration equipment which are to be furnished under other Divisions, but are to be installed under this Division, outside piping, grading and roadways.

Division II—Pumping Equipment, comprises the furnishing, testing and delivering of two 21 M.G.D., one 10 M.G.D., and one 5 M.G.D. electric motor driven pumps and two 21 M.G.D., and one 14 M.G.D. gas engine driven pumps operating at heads varying from 15 to 40 feet. Included in this Division are the required motors, engines, and drives and supervision of the installation of the equipment.

Division III—Vacuum Filtration Equipment, comprises the furnishing, testing and delivering of two vacuum filters, each 10 feet in diameter and 10 feet long, all accessory equipment, and supervision of the installation of the equipment.

Division IV—Electrical work, comprises the furnishing and installation of all electrical controls, switchgear, wiring, conduits and lighting fixtures.

Division V—Heating and Ventilating Work, comprises the furnishing and installation of boilers, convectors, unit heaters, air conditioning equipment, piping and appurtenances.

The Instructions to Bidders, Proposal, Agreement, Specifications, Plans and Form of Performance Bond may be examined at the office of the City of Alexandria, Virginia, Sanitation Authority, 113 North St. Asaph Street, Alexandria, Virginia, and at the office of Greeley and Hansen, Engineers, 220 South State Street, Chicago 4, Illinois. Copies of these Contract Documents may be obtained upon the deposit of $25.00 for each set, to be refunded upon return of such set in good condition within 10 days after opening of proposals.

Each proposal must be accompanied by a bid bond or a certified check on a solvent bank or trust company, made payable to the City of Alexandria, Virginia, Sanitation Authority in the amount of five per cent (5%) of the total bid, as assurance that the bid is made in good faith.

Bidders must be registered as Contractors in the Commonwealth of Virginia as provided by Chapter 7 of Title 54 of the Code of Virginia of 1950.

The City of Alexandria, Virginia, Sanitation Authority reserves the right to waive any informalities in or to reject any or all bids and to accept the bid which it deems most favorable to the interest of the Authority after all bids have been examined and canvassed.

City of Alexandria, Virginia,
Sanitation Authority
(Signed) JAMES J. CORBALIS, JR.
Engineer-Director

Dated: July 21, 1954
Alexandria, Virginia

U. S. Government

Sealed proposals for the purchase, dismantling, and removal of French Canal Railroad Bridge and purchase of 300 net tons of unclassified scrap metal offered for sale by Panama Canal Company will be received by Procurement Officer, 21 West Street, New York 6, New York until 10:30 A.M. Eastern Standard Time, August 31, 1954. Bid forms and additional information available at Panama Canal Company, 21 West Street, New York 6, New York. BO-9-5380.

OFFICIAL PROPOSALS

Bids: September 14, 1954

Demolition and Removal of the Old Granville Bridge

CITY OF VANCOUVER
BRITISH COLUMBIA, CANADA
NOTICE TO CONTRACTORS

SEALED TENDERS are invited from Contractors for the demolition and disposal of the old Granville Bridge over False Creek and Granville Island, Vancouver, B. C.

TENDERS WILL BE RECEIVED BY THE UNDERSIGNED NOT LATER THAN 9 A.M. SEPTEMBER 14TH, 1954, AND SHALL BE MARKED "TENDER FOR DEMOLITION OF OLD GRANVILLE BRIDGE". TENDERS RECEIVED AFTER TIME NOTED WILL BE RETURNED UNOPENED.

Plans, Specifications, Form of Tender and other particulars may be obtained at the office of the City Engineer, City Hall, Vancouver, B. C. upon payment of the sum of Twenty-five Dollars ($25.00) which sum will be refunded on the return of the plans, specifications and other documents in good condition.

Each tender must be accompanied by the sum of $10,000.00 or in lieu thereof by a cheque duly certified by a Vancouver Branch of a Chartered Bank in Canada for the sum of $10,000.00, payable to the City of Vancouver, or by a bid bond of a Guarantee Company, authorized to carry on business in the Province of British Columbia, for payment to the City of Vancouver of the said amount, conditioned upon the due execution of a formal contract with the City of Vancouver satisfactory to the City Solicitor. The said sum of $10,000.00 or the amount of the said cheque or bond of the successful tenderer will be forfeited to the City of Vancouver aforesaid, should he decline or fail to enter into a contract for the work as aforesaid, within six days after being notified by the City Solicitor so to do.

The certified cheque or bond accompanying each unsuccessful tender will be returned to such tenderer upon the awarding of the contract to the successful tenderer.

The successful tenderer will be requested to furnish a performance bond for the sum of One Hundred Thousand Dollars ($100,000.00) in a form approved by the City Solicitor, conditioned upon the due and proper performance of the Contract. When the said performance bond has been furnished the said bid bond or cheque for Ten Thousand Dollars ($10,000.00) of the successful tenderer will be returned.

Tenders must follow the Form of Tender supplied by the City Engineer. The said tenders will be opened at 10 a.m. September 14, 1954, in the No. 1 Committee Room, City Hall, Vancouver, B. C.

The lowest or any tender not necessarily accepted.

RONALD THOMPSON,
CITY CLERK.

City Hall,
Vancouver, British Columbia,
Canada.
July 13th, 1954

Bids: August 19, 1954

Integrated Sewerage System

FAIRFAX COUNTY, VIRGINIA

Sealed bids will be received by the Board of County Supervisors of Fairfax County, Virginia, at the Office of the Sanitary Engineer, County of Fairfax, Fairfax, Virginia, until Thursday, August 19, 1954, at 2:00 o'clock, P. M. Eastern Daylight Saving Time, for the construction of:

CONTRACT NO. 25: Approximately 7,900 lineal feet of 12 to 36 inch sanitary sewers and appurtenances.

CONTRACT NO. 26: Approximately 5,200 lineal feet of 8 inch sanitary sewers and appurtenances.

CONTRACT NO. 27: Approximately 6,000 lineal feet of 8 inch sanitary sewers and appurtenances in miscellaneous extensions to existing system.

Promptly thereafter they will be publicly opened and read in the Board of County Supervisors Room, County Office Building, Fairfax, Virginia.

Plans, specifications, and contract documents may be examined and copies thereof may be obtained at the Office of the Sanitary Engineer, upon payment of Ten Dollars ($10.00) per set for Contract No. 25 and Five Dollars ($5.00) per set for Contracts No. 26 and 27, which amount shall not be returnable.

All bids must be on the form contained in the Contract and Specifications.

Contractors, whether resident or non-resident in Virginia, will be required to show evidence of a Certificate of Registration as required by Chapter 7 of Title 54 of the Code of Virginia before their bids will be considered, if the bid is $20,000 or more.

Each bid must be accompanied by cash, or by the certified check of the bidder, made payable to the Director of Finance, County of Fairfax, Virginia, or by an acceptable bidder's bond in an amount not less than Five Percentum (5%) of the amount of the total bid. The successful bidder will be required to furnish a performance and maintenance bond in a penal sum equal to the full contract price.

No bid may be withdrawn for a period of thirty (30) days after the actual opening thereof and the right is reserved to waive any informality therein and to reject any or all bids.

COUNTY OF FAIRFAX, VIRGINIA
BY: Harry L. Hale, Sanitary Engineer
Dated: July 20, 1954

Bids: August 6, 1954

Construction Work

NOTICE TO CONTRACTORS: THE POWER AUTHORITY OF THE STATE OF NEW YORK will receive sealed proposals for the construction of Cofferdams A and B, unwatering Cofferdam area, construction of bridge, and incidental work for Long Sault Dam, near Massena, St. Lawrence County, New York, until 10:30 A.M. Eastern Standard Time on the 6th day of August, 1954 at the Authority's Office, 270 Broadway, Room 1207A, New York 7, New York, at which time and place proposals will be publicly opened and read aloud.

The principal items of work are:

SCHEDULE NO. 1

Estimated: 1,000,000 cu yds	Excavation (Various Classes
260 cu yds	Concrete
20,000 lbs	Reinforcement Steel in Structure
100 tons	Structural Steel
55 Mfbm	Timber in Structure
114,000 cu yds	Earthfill in embankment
275,000 cu yds	Rockfill and Riprap
6,350 ac.-ft	Unwatering

AND

SCHEDULE NO. 2—ALTERNATE I

3,750 Mfbm	Timer Crib Cofferdam
1,030 tons	Steel Sheet Piling
76,000 cu yds	Rockfill in Cribs

OR

SCHEDULE NO. 3—ALTERNATE II

4,050 tons	Steel Sheet Piling
110,000 cu yds	Cell Fill, Earth

Plans, specifications and Proposal Forms for the work are on file in the Authority's Office and in the offices of the Engineers, Sanderson & Porter and Uhl, Hall & Rich, 52 Broadway, New York 4, New York and 230 Congress Street, Boston 10, Massachusetts; The Hydro-Electric Power Commission of Ontario, 620 University Avenue, Toronto 2, Ontario, and may be inspected by prospective bidders during office hours.

Plans, specifications and proposal Forms may be obtained from the Power Authority of the State of New York, 270 Broadway, Room 1300, New York 7, New York, upon application and payment of a fee of Fifty ($50.00) dollars, no part of which will be refunded.

Bids must be made upon the proposal forms included in the Contract Documents. Each proposal must be accompanied by draft or certified check payable to the order of The Power Authority of the State of New York for the Sum of $100,000.00.

The right is reserved to reject any or all bids.

W. S. CHAPIN
GENERAL MANAGER

OFFICIAL PROPOSAL

RATE: $1.50 per line (or fraction) per insertion.

CLOSING DATE: 10:30 a.m. Friday for issue out following Thursday.

SEND COPY: Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

Senior and Junior

Highway and Bridge Designers, Draftsman

Excellent opportunity, permanent positions with well established Consulting Engineer, in a long range program. Location East Orange, N. J., Harrisburg, Pa., Submit resume.

BERGER ASSOCIATES, Inc.

1 No. Harrison St. East Orange, N. J.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED: Instructor of Engineering Drawing and descriptive geometry. Salary up to $4,700 for 9 month period and assistant professorship for qualified person. M. E. graduate preferred. Dept. of Engr. Drawing, University of North Dakota, Grand Forks, North Dakota.

MALE HELP Wanted: Experienced Structural Draftsman. Personnel—Box 1087, Charlotte 1, N. C.

CITY ENGINEER—City of Montebello, California (pop. 25,000) invites applications. California registration with one year of experience in municipal government in administrative capacity. Salary range—$629-$703. Maximum age 65. Apply by September 1, 1954 to Personnel Officer, City Hall, 140 North Sixth Street, Montebello, California.

POSITIONS OPEN for job superintendents or assistant superintendents. Excellent opportunity for young men under 32 years of age. Please give full statistical information in first letter. P-3339, Engineering News-Record.

HELP WANTED—Construction takeoff man for general contractor's office—preferably with professional quantity survey experience for concrete and carpentry trades. Recent engineering or architectural graduate considered. Write to Ajax Construction Co., Inc., 1107 19th Street, N. W., Washington, D. C. Salary open.

OPENINGS FOR qualified Civil Engineers & Draftsmen with Road Design experience for work in Central Section of the United States. Please give age, education, and experience. Each applicant will be promptly contacted. Apply by addressing Box P-3400, Engineering News-Record.

MECHANIC WANTED Immediately for general contractor's equipment. Must have experience on all phases of repairs for shovels, bulldozers, etc. Permanent position. Contact Testa Bros., Inc., St. Elmo Route #8, Chattanooga, Tennessee. Call 3-0535.

CONSTRUCTION SUPERINTENDENT—Experience in poured Gypsum roof decks for work throughout middle west by old established subcontractor. Reply giving age and experience. Good opportunity for aggressive man. P-3401, Engineering News-Record.

FIRST CLASS ornamental and stair draftsman. Good Pay. Steady Work. Reply to the City Iron Works, Inc., 350 New Park Avenue, Hartford, Connecticut.

SANITARY ENGINEERS (registered, professional) experienced, for State Health Department work. Salary $5760 to $6720, travel expenses. Contact Merit System Supervisor, Kentucky State Department of Health, 620 S. 3rd, Louisville, Ky.

SERVICE MANAGER for construction and industrial equipment dealer, Ohio. Must know tractors, shovels, compressors, and pumps. State age, salary, education, availability. Give detailed resume experience and references. P-3413, Engineering News-Record.

JUNIOR STRUCTURAL designer for contractor's engineering office, N.Y.C. Bulk storage and industrial structures, primarily concrete. Graduate engineer, service discharge. Some field experience preferred. Salary range $6,000-$6,500. P-3423, Engineering News-Record.

SELLING OPPORTUNITIES OFFERED

SALES ENGINEER — Rochester, New York and Pittsburgh, Pennsylvania territories open with established national concern selling prefabricated metal products to engineering and construction markets. Positions are permanent and offer excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Ages 24 to 30. Car furnished. Complete training program. Salary and bonus. RW-2289, Engineering News-Record.

(Continued on the following page)

The Port of Umatilla

On the Columbia River at McNary Dam

Desires to employ a manager

The Port of Umatilla is on navigable water from the port to the Pacific Ocean.

It is located adjacent to the mainline of the Union Pacific railroad, a transcontinental highway (US 30) and the mainline of the United Air Lines.

It has excellent industrial sites at riverside.

It serves a wealthy agricultural area.

It has available low cost hydroelectric energy.

A manager of the Port of Umatilla would:

(1) Study and determine the industrial potential of the port.

(2) Properly approach industries that would seem likely to be attracted to port facilities.

(3) Direct the planning of port development.

Address communications to:

J. W. Forrester Jr. **Box 559, Pendleton, Ore.**

BRIDGE ENGINEERS
AND SPECIFICATION WRITERS

Civil Graduates of accredited U. S. colleges. Must have not less than the following experience:

Detailers—2 years structural steel or reinforced concrete detailing.

Designers—5 years responsible work on structural steel and concrete including work on long span bridges.

Squad Leaders—3 years responsible charge of squad on structural steel detailing.

Specification Writers—With design and field experience for writing specifications for steel bridges, concrete structures, and highway construction.

Please mail complete resume together with salary required to:

Howard, Needles, Tammen & Bergendoff
55 Liberty Street New York 5, N. Y.

ENGINEERS

Foreign Service

Graduate Chemical, Mechanical, Electrical & Construction Engineers with minimum of 5 years' experience. For specialized assignments commensurate with qualifications in various phases of construction, estimating materials and cost control, planning and refinery process work. Write giving full particulars regarding personal history and work experience. Please include telephone number.

Recruiting Supervisor, Box 30

Arabian American Oil Company

505 Park Avenue, New York 22, N. Y.

SUPERINTENDENT

Wanted in East—must have references that he has recently supervised for Contractors, large Bridge and Highway Contracts and knows costs. Give age, experience, salary required and availability.

P-3404, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

WANTED

Designing engineers, highways-thruways, bridges, airfields, drainage, sanitation, hydraulic, soil mechanics, structural.

Draftsmen, designers, to Project Manager.

Submit resume

SEELYE STEVENSON VALUE & KNECHT
101 Park Ave. New York 17, N. Y.

ESTIMATOR WANTED

Must have recent experience in all phases of heavy construction, for Philadelphia. Reply by giving age, reference, salary desired and when available.

P-3403, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ENGINEERS

For supervisory positions with large consulting firm. At least 7 years' experience in design of hydro and hydraulic structures required.

HARZA ENGINEERING COMPANY
400 W. Madison Chicago 6, Ill.

WANTED

Construction Superintendent experienced on large scale rolled earth fill dam.

B. PERINI & SONS, INC.
FRAMINGHAM, MASS.

OPPORTUNITY

For an energetic engineer with sales personality

25 to 35 years of age, for sales work with company operating on nationwide basis furnishing Concrete Form Engineering and Rental Service. General construction experience and some Engineering college training essential. Give full details in first letter to

R. P. Wilkinson, Economy Forms Corp.
4301 N. E. 14th St., Des Moines 13, Iowa

SELLING OPPORTUNITIES OFFERED

(Continued from preceding page)

EXPERIENCED DIRT moving equipment salesman wanted—as district representative in Middle Atlantic territory by manufacturer of both capital items and wearing parts. All sales through established dealer organization. Give complete resume of experience, qualifications, salary requirements and availability. SW-3429, Engineering News-Record.

WANTED EXPERIENCED dirt moving equipment salesman as district representative in Missouri, Kansas, Nebraska, Iowa, Arkansas and Oklahoma territories by manufacturer of both capital items and wearing parts. All sales through established dealer organization. Please give complete resume of experience, qualifications, salary requirements and availability. SW-3430, Engineering News-Record.

EMPLOYMENT SERVICE

OVERSEAS PROJECTS Guide to most active constructors-engineers, oil co's., gov't & UN groups hiring for foreign projects. Send $1. Cove-McKane Int., GPO Box 126E, NY 1, NY.

EMPLOYMENT AGENCIES

WANTED ENGINEERS, Designers, Draftsmen-Structural, Architectural, M.E., C.E., E.E., and Industrial, also Teachers and Chemists. Cleveland Engineering Agency, 2132 E. 9, Cleveland.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT and Engineer with vast experience in housing projects, 22 years in construction. Man well qualified in cost reduction methods desires connection with firm building housing projects on small salary and bonus computed from cost saving. PW-2940, Engineering News-Record.

CHIEF STRUCTURAL Engineer, 30 years, experience steel and reinforced concrete; 20 years design supervision. PW-3263, Engineering News-Record.

GENERAL OR Plant Manager—20 years experience in fabrication of steel for buildings, bridges, and special structures. Experience includes sales, engineering and supervision of engineering, production and field erection forces and purchasing. Excellent production record. Reg. Prof. Engr. Age 38. Desire position with progressive company in this field. PW-3239, Engineering News-Record.

CHIEF ESTIMATOR—35 years practical experience, field and office, engineering education, progressive and receptive to new ideas, specializing in reinforced concrete masonry structures, mostly buildings, and with the ability, knowledge of costs and judgment necessary to meet present competition and stay in business. Expect to retire in five years and will train replacement in costs and business management. Now employed but wish to make change in locality with an aggressive responsible contractor. PW-3288, Engineering News-Record.

PROJECT MANAGER or Contractor's executive available. Broad experience heavy construction and buildings. Thorough organizer. Sound knowledge of field supervision, estimating, cost control, purchasing, subcontracts. New York preferred. PW-2942, Engineering News-Record.

GENERAL SUPERINTENDENT. Over 25 yrs. heavy construction experience. Qualified to take full responsibility of projects of any type or size. Good background, know men and equipment, available any location immediately. PW-2466, Engineering News-Record.

CONSTRUCTION OR Sales Engr. 29 B.S.C.E. 5 yrs. experience on Municipal work, Sewerage treatment, water treatment, earth fill dams, highways and pipeline work. 2 years of administrative work. 1 year of sales management work. Only responsible positions considered. PW-3337, Engineering News-Record.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT: Desire position with sound company in heavy construction. Experienced on Super-highways, pile driving, harbor work. Familiar with all type earth moving equipment. PW-3338, Engineering News-Record.

PROJECT MANAGER - SUPERINTENDENT: C.E. 20 yrs. experience heavy industrial, pipeline, gas compressor stations, highways and hydro-electric projects. Aggressive growth individual and a go-getter. Believe in finishing projects on time. Presently employed. Available Sept. 1st. Interested primarily in foreign assignment. Excellent references. Working knowledge Spanish and Turkish. PW-3294, Engineering News-Record.

CONSTRUCTION SUPERINTENDENT Mechanical and Structural Engineer, can take full charge of project including all related trades on heavy or light construction. Want responsible position with general contractor or architectural firm. Prefer south or southwest. Very good references. PW-3306, Engineering News-Record.

CONSTRUCTION EXECUTIVE, Engineering background, 29 years experience in design, estimating and construction supervision, all types building, harbor, and heavy construction. New York area preferred. PW-3319, Engineering News-Record.

ARCHITECT'S SUPERINTENDENT — Available soon. Long experience. Box No. PW-3324, Engineering News-Record.

HEAVY CONSTRUCTION supt. extensive experience on rock blasting, earth moving, and concrete. PW-3329, Engineering News-Record.

CONSTRUCTION SUPT. over 20 years broad experience—Industrial, institutional groups, commercial and schools. Engineer. PW-3372, Engineering News-Record.

ATTENTION—ARCHITECTS, Engineers, Contractors and Manufacturers, immediately available and willing to relocate. Family man (Age 39) (Wife & 10 yr. old son), having diversified experience including serving millwright apprenticeship, owner and management of manufacturing firm and the practice of architecture, desires to make permanent connection offering potential of his becoming an integral part of the organization and community. Especially qualified in technical and legal writing; i.e., studies, reports, specifications, operational manuals, contracts, etc. Also experienced in estimating, planning & scheduling, design, construction supervision, public relations, public speaking and promotional work. Wife is certified school teacher and desires to continue teaching. ELJ—P. O. Box 13, McDermott, Ohio.

CHIEF ENGINEER—mechanical, with excellent architectural, civil and electrical experience. Now holding executive position but desires new connection or partnership with consulting engineer, architect or contractor. Specialty is design and construction of large industrial projects. Have also handled small industry, public and institutional work. In construction for 27 years. Extensive field experience as architect's and contractor's superintendent. Graduate M. E. and registered P. E. PW-3389, Engineering News-Record.

CIVIL ENGINEER, M.S.C.E., Regis. Calif. 6 years experience in hydraulics, specifications, and small construction. Presently doing general civil work with utility co. will relocate. Would consider association with consultant. PW-3399, Engineering News-Record.

LEARN ESTIMATING

Complete Building Estimators Course, also Building Labor Calculator for practicing estimators. Thirty-fourth year serving the building industry. For free trial and all particulars write:

TAMBLYN SYSTEM
1420 Gilpin St. Denver 6, Colorado

Engineers—Foremen—Office Men

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Send post card for details.
GEO. E. DEATHERAGE & SON
CONSTRUCTION CONSULTANTS
411 So. 5th Ave. Lake Worth, Florida

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ARCHITECTURAL ENGINEERING
OUR COURSES of instruction by mail HAVE HELPED THOUSANDS to better positions and to pass State Board Examinations. Forty-third year.
WILSON *Engineering Corp.*
College House Offices HARVARD SQ. CAMBRIDGE, MASS

POSITIONS WANTED

CIVIL ENGINEER: P.E., B.C.S.E., age 28, married; 5 years experience in sanitary and municipal engineering with a consulting engineer. Experience in design and construction of sewage treatment plants. Presently located in the mid-west. PW-3393, Engineering News-Record.

TUNNEL CONSTRUCTION Supt. 20 years experience at tunnel excavation and concrete lining. Will consider foreign contract. References and back ground on request. Available after August 15, 1954. PW-3449, Engineering News-Record.

CIVIL STRUCTURAL Engineer. Age 29, six years experience in supervisory capacity, Near East and American, in waterworks development and maintenance, in concrete pressure pipe production and in prestressed concrete tanks construction. Experience includes operation, set-up and dismantling of plants and machinery. Desires responsibile position requiring initiative. Available beginning September. Reply Box PW-3444, Engineering News-Record.

GENERAL SUPERINTENDENT. Background of compressor stations, gasoline plants, tank farms, commercial buildings, plant layout. Concrete, masonry, structural, piping. Nine western States. PW-3398, Engineering News-Record.

ENGINEER, B.S.C.E., age 28, married, 5 years civil and mechanical experience designing and constructing paper mills and power plants. Permanent position with Southern concern desired. PW-3387, Engineering News-Record.

ADMINISTRATIVE ASSISTANT—Twenty-Five years experience as controller, chief auditor and accountant with leading construction and engineering firms all types construction. Broad experience on large cost plus industrial and federal contracts. Know costs, finances, subcontracts and all executive details. First class references and bond. Box PW-3386, Engineering News-Record.

ASSISTANT TO Project Manager or Project Engineer—Graduate Mech. and Elect. engr., 34, 10 years exp., in North and S. America, hydro power developments, both design and field work; also mech. maint., heavy mach.; speaks fluent French, Sp. and Port.; Desires responsible position in S. America. PW-3384, Engineering News-Record.

CONSTRUCTION EXECUTIVE or superintendent available; qualified construction engineer, 54, location immaterial. Lifetime experience heavy construction both marine and shore; industrial, commercial and institutional buildings, large housing projects, private and public works; earth and rock excavations, mass and reinforced concrete, bridges, cofferdams; earth and concrete dams; power houses, railroad relocations, etc. Sound field and office organizer, job analyst; take-off, estimate, price quick and accurate; profit and cost conscious; know purchasing, sub-negotiating; sober, personable, aggressive, mature judgment and tact; salary secondary, permanence and chance to grow with expanding large or small organization. Would consider setting up and directing construction force for reputable organization planning expansion or extensive alteration program. PW-3409, Engineering New-Record.

ELECTRICAL STAFF Engineer & Draftsman 10 years Industrial experience in Power wiring, lighting layouts and Automatic equipment control wiring. Married, age 33 desires responsible position with future. PW-3426, Engineering News-Record.

LITERATURE WANTED

Exporting Construction Machinery Distributors send literature to Chester E. Houghton, Box 287, Vet. Adm. Branch, Los Angeles 25, Calif.

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Structural and Plate Steel Fabricators

Open capacity for quick delivery now available. We solicit your inquiries for Steel Fabrication and Warehouse Steel Products. Let us figure your jobs . . . Large or Small.

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New Orleans, La.
Phone, Express 2761

P. O. Box 1390
Knoxville, Tenn.
Phone 4-8601

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55 CFM Lindsay (GAS) Portable
60 CFM LaRoi-CPT-Worthington-Portable
80 CFM 6 x 5 Worthington HB-10 HP, Electric
105 CFM Worthington-CPT-Portable
122 CFM 7x7 Worthington HB-20 HP Electric
160 CFM Worthington-Portable
170 CFM Davey Semi-Portable 25 HP Electric
195 CFM 8-9 x 9 Chicago T-8 Steam
210 CFM Worthington (GAS & DIESEL) Portable
211 CFM 9 x 9 Ingersoll & CPT, 40 HP Electric
284 CFM Worthington Semi-Portable, 50 HP Electric
315 CFM Worthington (GAS or DIESEL) Portable
364 CFM 20 PSI 12 x 7 Gardner Denver
388 CFM Worthington Semi-Portable, 75 HP Electric
426 CFM 12 x 11 Ingersoll Rand ES, 75 HP Electric
500 CFM Worthington (DIESEL) Portable
552 CFM 13/9 x 10 Chicago 0-CB Duplex
600 CFM Worthington (DIESEL) Portable
622 CFM 14½ x 13 American AF - 100 HP Electric
1085 CFM 35 PSI 20 x 12 Pennsylvania
1452 CFM 70 PSI 15/15 x 14 Pennsylvania Duplex
3582 CFM Ingersoll PRE-2, 600 HP Electric

— MANY OTHERS TO CHOOSE FROM —

VACUUM PUMPS

167 CFM 10 x 5 Ingersoll 7½ HP Electric
225 CFM 6 x 5 Worthington "V" 15 HP Electric
434 CFM 14 x 7 Ingersoll 15 HP Electric
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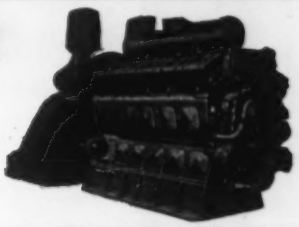

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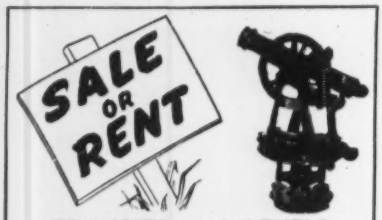

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use this section, as many contractors do, as a pipe buying directory. It can save you time when you want to know, quickly, where to buy good new or used pipe.

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Amsco manganese steel dippers are regularly ordered for replacement on equipment in the field. Often they go to users who found that ordinary steel dippers simply would not hold up.

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AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Ill.

WET SNOW was handled by the new loader at the rate of 7 yd per min on a northern Michigan job.

GEORGIA CLAY and sand was fed through the loader at 4 yd per min to clear 200 truck loads in a 9-hr day.

Low cost loader has 4 yd per min capacity

A medium capacity unit with a high degree of maneuverability and a low price tag—$5,800 f.o.b. Aurora, Ill.—is the capsule description of Barber-Greene's new Model 500 Windrow Loader.

Basically, the 550 consists of a mechanical feeding mechanism and conveying boom mounted on a rubber-tired Model 50 John Deere tractor. Choice of the John Deere pays dividends to the purchaser not only in lower initial costs but also in greater availability of parts and service.

The feeding mechanism employs three claw-like spades operating on eccentrics and rocker arms. The spades attack the material with a clawing-chopping action to reduce large lumps of sod, snow, ice, etc. to more easily managed sizes and pull the material onto the moving conveyor.

Should the loader encounter a buried rock or similar object, the entire feeding mechanism is free to raise up to clear the obstruction then return to its operating position automatically.

A short turning radius of only 8½ ft makes the unit well adapted to narrow road work. It is unnecessary to travel to a driveway or other intersection before turning around. Travel speed is 10 mph.

A discharge height of 10 ft with an overhang of 8 ft under the conveyor boom permits loading without chutes or swivel heads, but an adjustable side-discharge baffle is provided. A protective railing beneath the boom prevents trucks from backing in too far and a heavy wire guard protects the operator and tractor from stones.

Power operated hydraulic rams lift the entire loading boom for transport. The weight of the boom is transferred directly to the tractor frame by means of radius rods, and a special device compensates for side-mounting of the boom.

The 18-in. belt conveyor is carried in a lightweight channel frame braced

(Continued on page 109)

20-tonner is really maneuverable

High horsepower—225 or 275—and a short wheelbase—120 in.—are reported to make new Dart 20-tonner an extremely maneuverable workhorse. Hydraulic steering enables the operator to whip the unit around a circle with a 21-ft radius. The diesel-powered rig is available with conventional transmission or torque converter. Two stage springs, front and rear, are unusually long for a design of such short wheelbase, but they are said to be easier riding and offer greater protection to tires and the truck itself. Dart Truck Co., Oak at 27th St., Kansas City 8, Mo.

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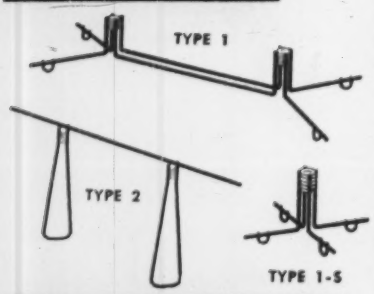
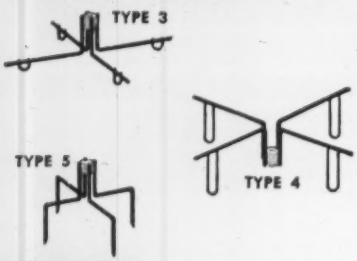


ANCHORS for BRACES



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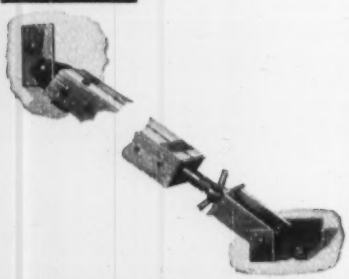

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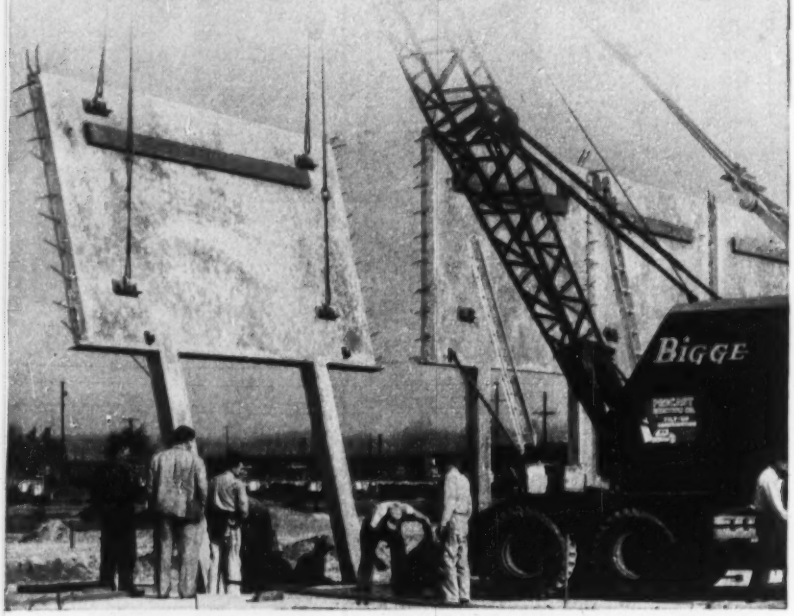

***42,000 LB. PANEL** being raised into position at United Grocers Warehouse, Fresno, Calif. Concrete panels are 8-inches thick with 12-ft. legs. SUPERIOR Pick-Up Inserts, Brace Anchors, and Braces were used. The exclusive pivoting action of the adjustable Braces permitted quick positioning and alignment of the panels. Contractor: Precast Erection Company, Niles, California.*

Tilt—Lift—Position!—The proper type of Pick-Up Inserts and Brace Anchors and their location in the slab or precast structural member is of prime importance in order to withstand the stresses occurring when *tilting, lifting,* and *positioning.*

As pioneers in this field, SUPERIOR has developed various types of accessories and correct procedures and techniques resulting from the experience of thousands of job applications.

The many types of SUPERIOR Inserts, Anchors, and Braces for every job condition together with complete engineering service provide a combination which offers safe and efficient handling of any precast panel or structural member.

For details request a copy of Bulletin TU-2.

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with torque tubes that also provide support for the two-roll troughing carriers. Return rollers are equipped with disc rolls as a protection against freezing or buildup of material.

For the past two years the company has operated a number of pilot models in a wide range of applications and under many sorts of working conditions. In Georgia, a loader was employed to pick up moist sand and clay bladed off a street surface preparatory to paving. According to the manufacturer, 200 truck loads from 3½ to 4 yd each were handled in a 9-hr day.

Loading 5-yd trucks in 1½ min with sand, loam and a high percentage of gravel and broken rock on a Texas highway was another job performed. In one 6-hr day 158 trucks were loaded, and in another 7-hr period, the total rose to 162 trucks. It is pointed out that these and the other tests conducted by the company were under realistic conditions, that is, in no case did the number of trucks available exceed or even equal the continuous capacity of the loader.

The loader can be moved from job to job under its own power or loaded on a trailer. Total weight of the unit: about 7,500 lb. BARBER-GREENE CO., 400 N. HIGHLAND AVE., AURORA, ILL.

Portable ventilator moves approximately 3,000 cfm

Usable as a blower or an exhauster, a new two-way ventilating system is available as a compact, portable unit. Wheel-mounted, it measures 26½ in. high and 24 in. long.

The ventilator is driven by an electric motor and is capable of moving about 3,000 cfm. The equipment is supplied with 15 ft of three-wire electric cable, a 15-ft length of 14-in. dia duct and two carrying belts. MINE SAFETY APPLIANCE CO., 201 N. BRADDOCK AVE., PITTSBURGH 8, PA.

Wider belt increases elevating grader capacity

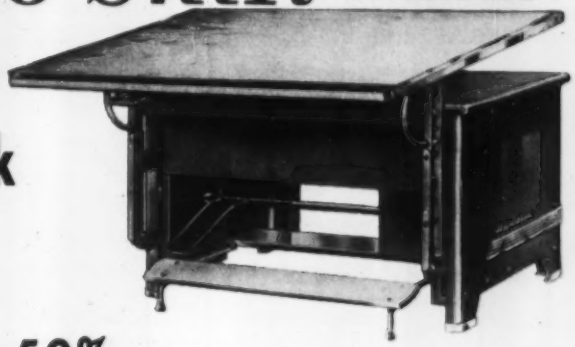
A new 42-in. troughing belt-type carrier has been added to the line of Elegraders manufactured for Adams motor graders. The new unit also incorporates a larger 32-in. dia disc and heavier plow beam.

Further, an extended lower lip design stops the disc from cutting the belt in any operating position and also protects the belt from broadside impacts. A 30% greater capacity with the same horsepower grader is claimed for the new troughing belt unit. THE REISSER CORP., BLAIR, NEB.

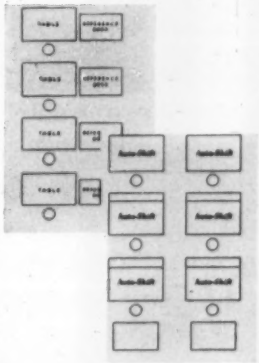
(*New Products continued on page 110*)

Auto-*Shift* TABLES

help get the work done

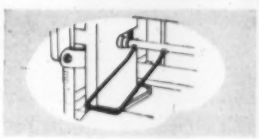


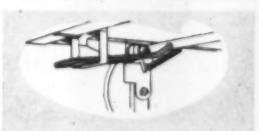
with 30-50% more space efficiency!



About 250 square feet accommodate *two more* Auto-*Shifts* than separate boards and desks. Auto-*Shift* puts a large reference surface and drawer directly behind each draftsman for greater space *and* operating efficiency—especially in row installations as shown below.

with much less draftsman fatigue





Auto-*Shift* provides fast, simple board adjustment—lets draftsman change working position often. Handy foot release (Fig. 1) frees top for height adjustment. Hand release (Fig. 2) permits easy slope adjustment. Fully counterbalanced top moves effortlessly.

See how Auto-*Shift* helps get the work done. Mail coupon below today!

DRAFTING EQUIPMENT DIVISION **Hamilton** MANUFACTURING COMPANY, TWO RIVERS 3, WISCONSIN

This Auto-*Shift* booklet is yours, *free*. Contains all the Auto-*Shift* facts, new ranges of sizes, data on new models for front and rear of row installations. Fill out and mail this coupon now!

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TIMBER TIPPING stinger is applied after roots have been severed by . . .

ROOT CUTTING blade that is designed to replace usual standards on rock ripper.

Land Clearing Made Easy

A new root cutting blade capable of penetrating 30 in. below ground surface and cutting roots up to 10 or 12 in. in dia has been developed for use with Ateco rock rippers mounted on Caterpillar D8 tractors.

The new root knife replaces the usual standards on the ripper to make a compact root-cutting tool that works anywhere the tractor can go.

In operation, the operator lowers the hydraulically-controlled root knife close to the tree and makes a few deep passes to cut the supporting roots. A push on the trunk with the special stinger mounted above the bulldozer brings the tree down where it can be bulldozed away. The operation reportedly requires no more than a few minutes even on large trees.

The 860-lb blade is made of heat-treated alloy steel 3 in. thick and 18 in. wide at the bend, tapering to a 10½-in. width at the point, sharpened and hard faced at one edge. Total weight of the ripper with blade is approximately 8,000 lb. The stinger is built by the PETERSON TRACTOR AND EQUIPMENT CO., 955 FIRST AVE., SAN LEANDRO., CALIF. The root cutter is manufactured by AMERICAN TRACTOR EQUIPMENT CORP., 9131 SAN LEANDRO BLVD., OAKLAND 3, CALIF.

(*New Products continued on page 112*)

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Prevents corrosion!

use this Corporation Stop with Insulating Coupling Outlet!

Designed for a specific need, this Corporation Stop with Insulating Coupling Outlet minimizes electrolytic action and subsequent corrosion by completely insulating copper service lines from the main.

The Insulating Outlet Corporation Stop is easily installed in the main, under pressure, with the Mueller "B" Machine. Copper service pipe is flared with standard tools to prevent pull-out. Coupling needs only minimum tightening for a perfect seal.

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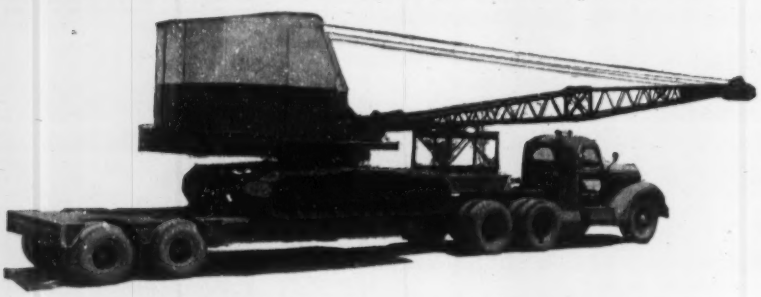

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MODEL KSO-D
Dual axle drop bed semi, capacities 15 through 30 tons.

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8-10 ton capacities. 14 or 18 foot platform lengths.

YOU CAN DEPEND ON TRANSPORT TRAILERS

CARGO CARRIER MODEL GPX-F

Especially designed for safe, secure hauling of heavy cantilever loads. Capacities 16 through 35 tons. Exclusive TRANSPORT tandem axle assembly gives full oscillation of each axle over rough roads . . . adds extra mileage to trailer tires . . . reduces road shock transfer to payload. TRANSPORT semi-trailers fit single or tandem axle truck tractors. Flate deck as shown or drop deck.

FOR ADDED SERVICE . . .

Single or dual axle TRANSPORT front dollies convert semis to full trailers easily and quickly.

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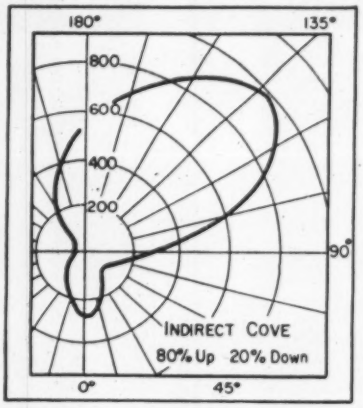
NEW PRODUCTS



Flourescent bracket serves two lighting purposes

A new approach to cove lighting is seen in a new two-in-one bracket fixture recently introduced. It may be used as either a cove indirect or a direct downlight — mounting either way without extra gadgets or any change in the fixture.

According to the manufacturer, the fixture maintains high efficiency by beaming 80 per cent of the light directly upward and outward, 20 per cent is beamed downward to brighten sidewalls. Of course, when the fixture is reversed, 80 per cent of the light is beamed downward and outward.

A louver-diffuser over the two fluorescent tubes provides shielding in the 45 x 90 deg. zones. The fixture is available in 24, 48 and 96-in. lengths. The Edwin F. Guth Co., 2615 Washington Ave., St. Louis 3, Mo.

New membrane material boasts greater economy

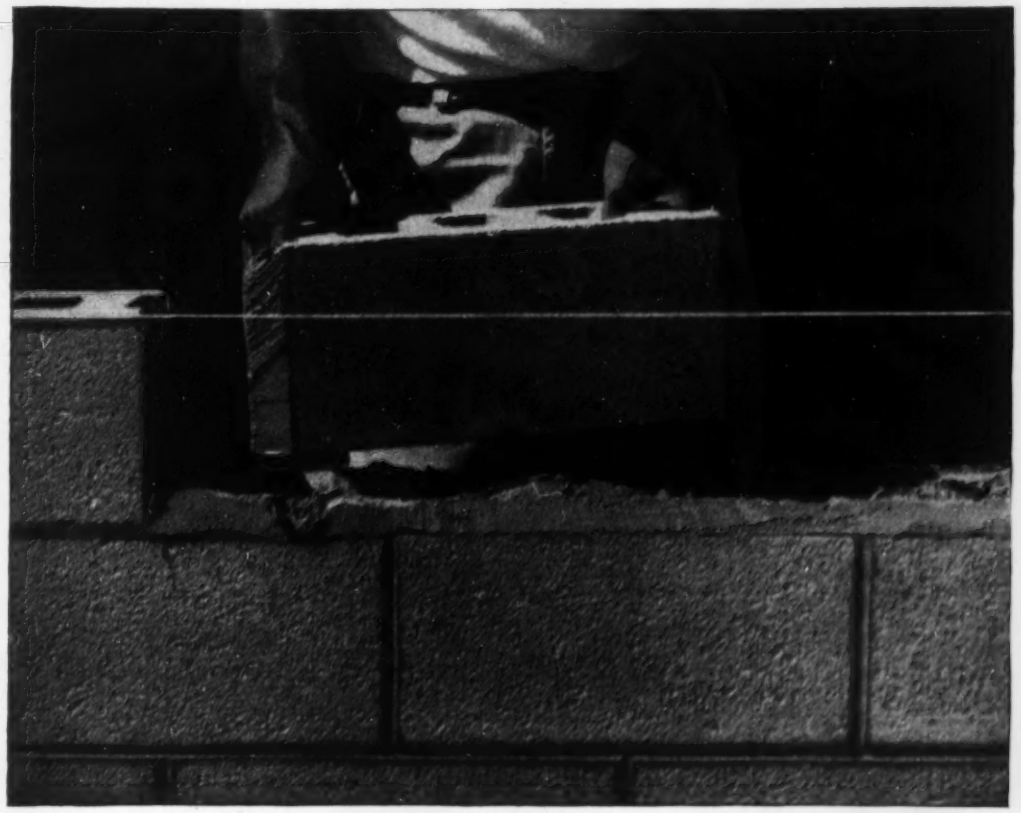
Richkraft 65 is the designation given to a new membrane material designed for use over subfill and crawl spaces. According to the manufacturer, the material has been accepted by the F.H.A. as a replacement for two-ply 15-16 felt or 55-lb roofing.

Usage has reportedly proven 65 a more economical sheet because of its ease of application. It is said that two men can do 14 houses—1,000 sq ft each—in eight hours compared with three men required to do seven houses in the same time using 15-ft felt mopped together.

Richkraft 65 is made by laminating two fungicide-treated sheets of kraft paper. The product comes in 36 or 48-in. rolls containing 432 sq ft and 72, 84 and 96-in. rolls containing 1,000 sq ft. Richkraft Co., 165 West Wacker Drive, Chicago, Ill.

BRIXMENT

Better Mortar for Blocks



BETTER PLASTICITY

To build the best possible concrete-block walls, the bricklayer must use plastic mortar. The mortar must be plastic enough to stick to the long head joint. It must not drop off when the mortared edges of the block are swung to a vertical position and lowered into place. It must be plastic enough to enable the bricklayer to quickly and accurately tap the block down to the line.

Brixment mortar provides this necessary plasticity. Moreover, it stays soft and plastic long enough to let the bricklayer level, plumb and straighten the unit and adjust it to its final position in the wall before the mortar stiffens.

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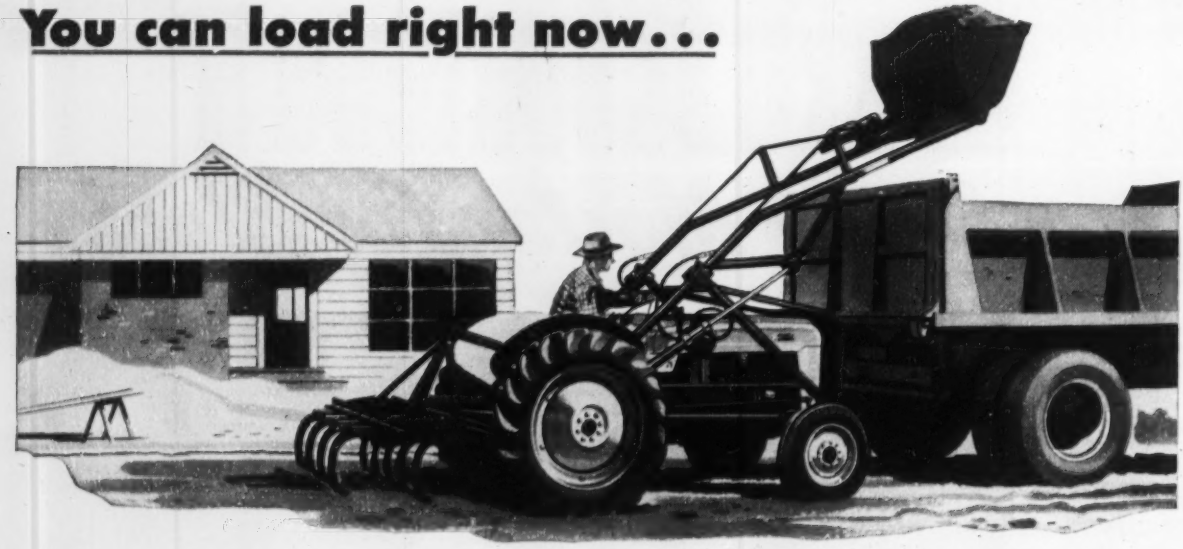

scarify 30 seconds later

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Here's a low cost way to speed completion of residential construction. And it's a sure way to impress prospective buyers, too! First, clean up lumber scrap and surface trash with the Ford Tractor and the—

DEARBORN INDUSTRIAL LOADER

With this team you can lift 1000 pounds . . . clear 10½ ft. to load high-bodied trucks. It's easy to operate—highly maneuverable. Nine cubic foot bucket is controlled by twin hydraulic cylinders.

Because the Industrial Loader has its own separate hydraulic system, Ford Tractor hydraulic power is free to operate rear attached tools. So, when everything is cleaned up, just touch a lever and lower the—

DEARBORN FIELD CULTIVATOR (Spring-Loaded Scarifier)

Now you're ready to give your job extra appeal that will interest more buyers—maybe turn the sale! Just once over the ground with this Dearborn tool and you break up hard-packed soil. This means easier seeding and thicker stands of grass later on . . . a neater, cleaner landscape right now. Working depth is hydraulically controlled. Spring-loaded shanks slide easily over hidden rocks without breaking.

This is one way the Ford Tractor can help you get extra profit from every job—extra time, labor and equipment savings every day. And there are many more. To find out about them, see your nearby Ford Tractor and Equipment Dealer, or write to the address below.

Ford TRACTOR

TRACTOR AND IMPLEMENT DIVISION, FORD MOTOR COMPANY
Birmingham, Michigan

Dearborn EQUIPMENT

PUBLICATIONS

Crane control—A 12-page illustrated brochure describes the air control system on the Michigan line of excavator cranes. The brochure, illustrated with pictures and drawings, explains the theory and practical application of the air controlled clutches—standard on the Michigan line. Graphs and tabular data are presented to give comparative figures on time tests between machines equipped with air controls and those with mechanical controls. CLARK EQUIPMENT CO., CONSTRUCTION MACHNY. DIV., BENTON HARBOR, MICH.

Water softener—A new 4-page bulletin entitled "The Dorrco Hydro-Softener" includes a description of the physical characteristics, sizes and capacities, operation, advantages, and applications of this new continuous water softener, and cites operating data from a municipal installation. THE DORR CO., BARRY PL., STAMFORD, CONN.

Flow meters—Catalog 2320 describes all types of flow meters made by Minneapolis-Honeywell. It includes indicating, recording, integrating and controlling instruments of both evenly graduated and square root types as well as area meters and differential converters. Also included is a section on flow approximations and installation information. MINNEAPOLIS-HONEYWELL REGULATOR CO., STA. 64, WAYNE & WINDRIM AVES., PHILADELPHIA 44, PA.

Conveyor belts—"Conveyor Belts by Hamilton" is a new 30-page catalog dealing specifically with industrial rubber conveyor belting. The catalog notes many typical belting installations and contains technical data on belting construction. Illustrations describe belt covers, breaker fabric, rubber friction, skim coat and reinforced rubber friction, skim coat and reinforced rubber edges. HAMILTON RUBBER MFG. CORP., TRENTON 3, N. J.

Windows—A new 12-page catalog describes the line of stock metal building products for residential and commercial builders. The products featured include fenestra residence casement windows, residential projected windows, installation accessories for windows, outside-inside metal trimmed unit, steel window wall units, basement and utility windows, sliding closet doors, hollow metal doors, and others. DETROIT STEEL PRODUCTS CO., 3159 GRIFFIN ST., DETROIT 11, MICH.

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EDITORIALS

Interstate compact still needed

When the recent Supreme Court decree on the Delaware River established a new release formula, substantially agreed upon as equitable for the present by all four states involved, an editorial on this page asked why a master for the Supreme Court succeeded in doing what the Interstate Commission on the Delaware River Basin failed to do (ENR June 17, p. 152).

Two letters prompted by the question have done much toward answering why Incodel failed in its attempt to effect a compact for full use of the interstate river. The first of these letters, published July 22, p. 12, came from Samuel S. Baxter, water commissioner of Philadelphia. His letter reasoned that "if the matter at issue is use of the Delaware River . . . the Supreme Court decision has not settled the matter. . . . We can only assume that the matter is headed for the courts again. If negotiation had continued, agreement could have been reached (on the Incodel plan)."

The second helpful letter, not published, came from Kurt F. Pantzer, special master in this Supreme Court case. His suggestion was that the answer to our question of why the Incodel plan failed might be found in his report to the court.

The report of the special master in this case is a remarkably interesting document—recommended reading. It goes into the theory of legal techniques, as they apply to negotiated agreements, and the available sanctions or means of enforcement. In this case, substantial agreement was reached through an unusual series of pretrial conferences; agreement was then buttressed by adjudication—through a decree of the court. A higher, more preferable sanction, says the report, is coextensive legislation—an interstate compact.

Mr. Pantzer's report says, "Delaware and Pennsylvania were not yet in any need of availing themselves of the additional water supply which would be produced by the (Incodel) plan. The Incodel plan further ran counter to realistic possibilities in requiring the coextensive enactment of substantially identical legislation . . . by the four states involved."

With New York City in immediate need of the right to more Delaware River water and able to offer a release formula, which for the present will benefit Delaware and Pennsylvania, it certainly was the practical thing to resort to adjudication to buttress negotiations in this case. As the master points out in his report, the ordinary citizen is more likely to trust a court of equity than a legislature because of the continuing jurisdiction that a court of equity can retain.

However, Mr. Baxter very correctly points out that Pennsylvania will want and need more Delaware River water. Samuel A. Greeley, acting as a consultant to Pennsylvania, calls 1978 the year it probably will be needed. As development planning takes about ten years, Mr. Baxter reasons that use of the river will again be at issue by about 1968—a mere 14 years.

That being the case, the benefits of inter-sovereign accord—as more permanently protecting public interests than a court decree—should not be overlooked. And it would seem that right now, before the issue cools down, would be the proper time for someone to inject renewed vigor into intensified negotiation on some modification of the Incodel plan. The same intelligent conference approach which led to the presently acceptable release formula could well produce accord on an interstate compact.

Only Pennsylvania balked at Incodel's proposed compact before. It would be an admirable thing indeed if Pennsylvania were now to assume the role of responsibility; to revive official interest in negotiating toward final, equitable settlement of the Delaware issue; and to resume very intensive public education in the water supply problem it will be up against in 14 years. Confronting the problem now, solving it, and insuring the solution with that higher sanction—the interstate compact—will mean avoiding future expedient court action. Such a step, too, will allow much more time for thorough, unhurried engineering planning and design of future projects on the Delaware.

Proper regional road planning

In sharp contrast to the lack of regional thinking applied to toll-road planning in the past is the three-state study inaugurated late in June by the governors of Ohio, Kentucky and Indiana (ENR July 1, p. 27). Each of the three states is planning toll roads, and the governors are anxious to see that the planning is closely integrated so that the new highways will be of greatest usefulness nationally as well as locally.

An unusual aspect of this study is the consideration being given to using one or more of the proposed new navigation dams across the Ohio River as foundation for the bridges that probably will be required for adequate interstate connections. Several new dams are proposed, which opens the possibility of changing the location of a proposed highway bridge (or of a proposed dam) to have the highway and dam cross at the same point. Such a plan might produce very considerable economies in the design of the bridge without adding materially to the dam designers' problems.

In any case, the need for more crossings of the Ohio in that general area has been evident for some time. Therefore, such a broad study, which is to include the question of arterial routes through or around the big river cities to be linked by the proposed toll highways, should be very productive. And free-road planning should benefit as well as toll roads.

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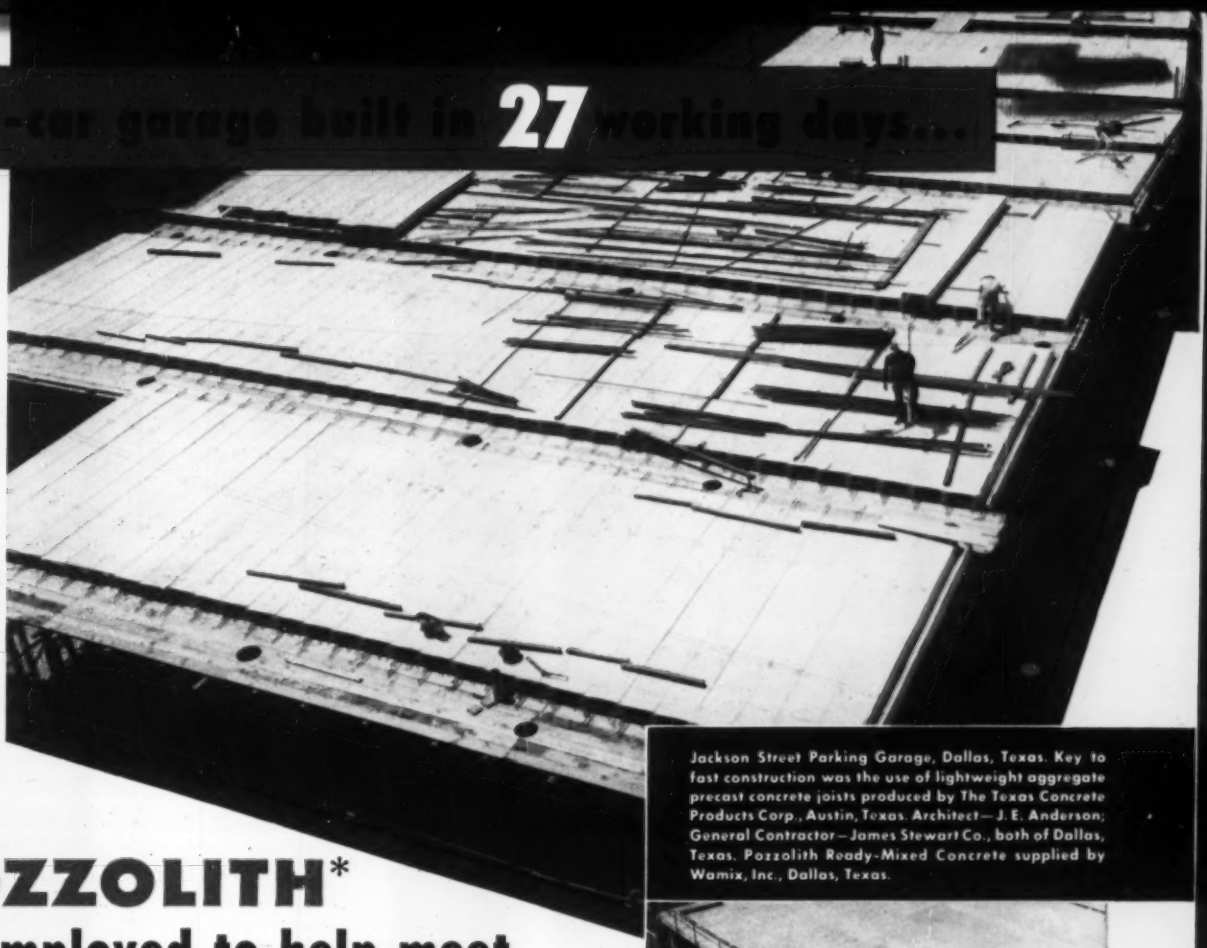

Jackson Street Parking Garage, Dallas, Texas. Key to fast construction was the use of lightweight aggregate precast concrete joists produced by The Texas Concrete Products Corp., Austin, Texas. Architect—J. E. Anderson; General Contractor—James Stewart Co., both of Dallas, Texas. Pozzolith Ready-Mixed Concrete supplied by Wamix, Inc., Dallas, Texas.

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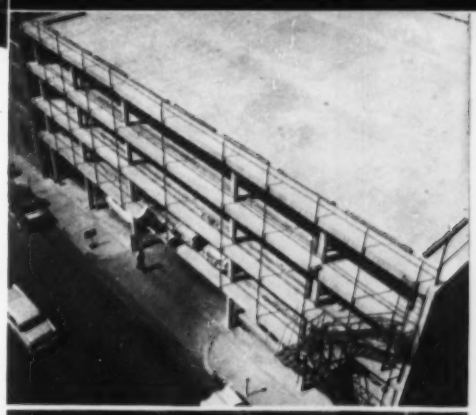

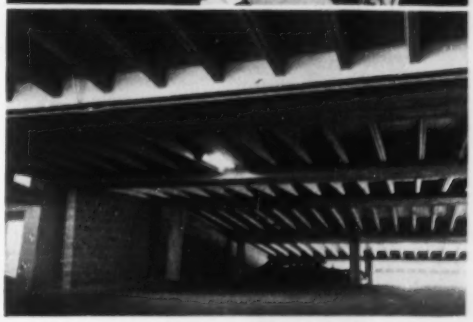

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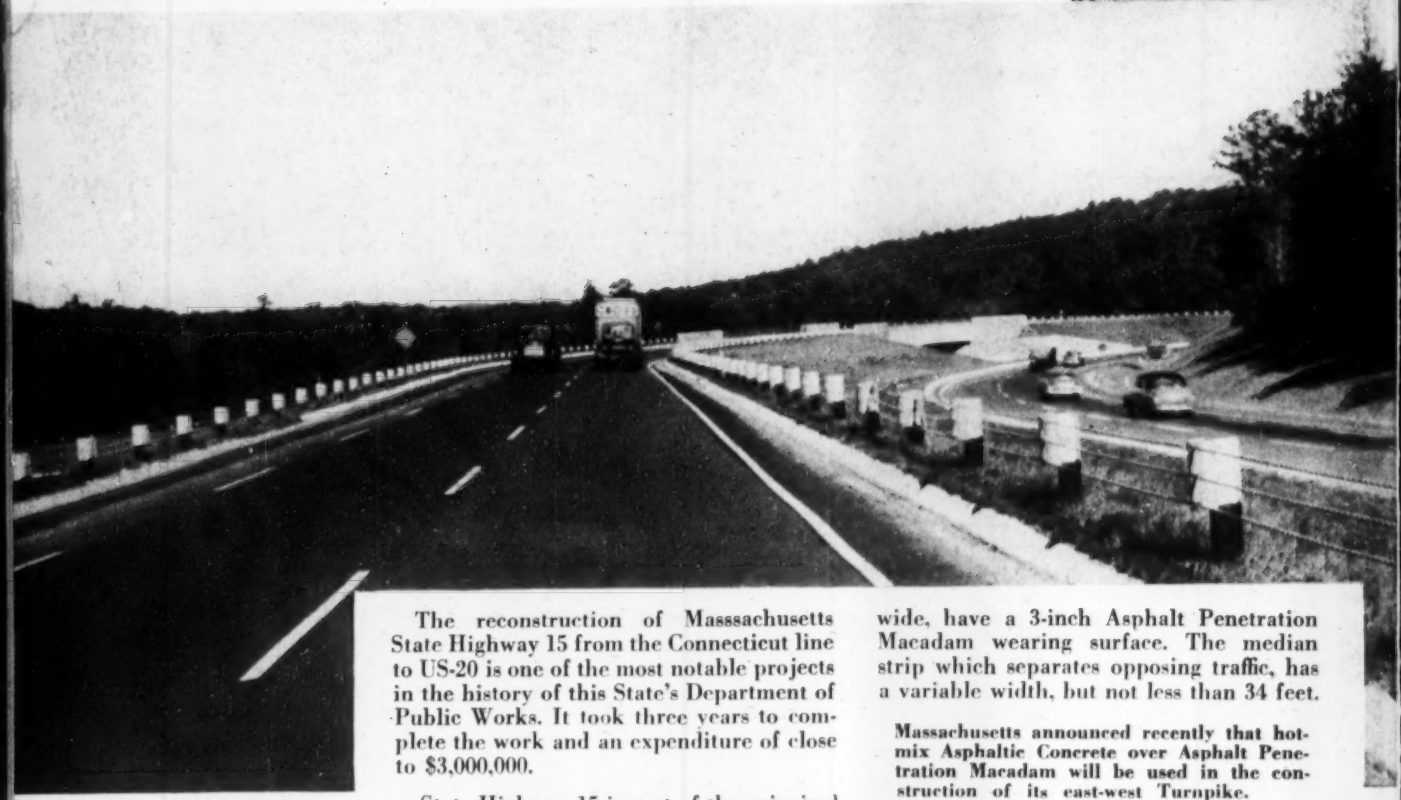

View of Massachusetts Route 15, now a dual highway south of US-20, with northbound lane showing at extreme right of photo. Paved with hot-mix Texaco Asphaltic Concrete on an Asphalt Penetration Macadam base.

This $3,000,000, three-year project was constructed under supervision of District Engineer Frederic W. Guerin of State Department of Public Works.

Texaco Asphaltic Concrete was laid by Bayer-Mingolla Construction Co., Worcester; asphalt was supplied by Wachusett Bituminous Products Co., Worcester.

The reconstruction of Masssachusetts State Highway 15 from the Connecticut line to US-20 is one of the most notable projects in the history of this State's Department of Public Works. It took three years to complete the work and an expenditure of close to $3,000,000.

State Highway 15 is part of the principal route used by motor vehicle traffic between New York City and Boston. It serves an average of 16,000 vehicles daily.

This Massachusetts project merits special attention as an outstanding example of the use of Asphalt construction on a modern, divided highway, designed to serve today's traffic—and tomorrow's.

Each half of the dual highway has a 24-foot paved roadway, consisting of a 2½-inch surface of hot-mix Texaco Asphaltic Concrete on a 4½-inch Asphalt Penetration Macadam base, supported by a 12-inch gravel sub-base. Both shoulders, one 10-feet wide for parking and the other 3 feet wide, have a 3-inch Asphalt Penetration Macadam wearing surface. The median strip which separates opposing traffic, has a variable width, but not less than 34 feet.

Massachusetts announced recently that hot-mix Asphaltic Concrete over Asphalt Penetration Macadam will be used in the construction of its east-west Turnpike.

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